

**NORTH PADRE ISLAND STORM DAMAGE
REDUCTION AND ENVIRONMENTAL
RESTORATION PROJECT**

NUECES COUNTY, TEXAS

VOLUME II: APPENDICES

FINAL

ENVIRONMENTAL IMPACT STATEMENT

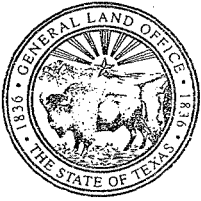
**U.S. ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT**

MARCH 2003

APPENDIX A

TEXAS GENERAL LAND OFFICE LEASE, MEMORANDUM OF UNDERSTANDING, MITIGATION PLAN, AND DREDGED MATERIAL DISPOSAL PERMIT

**Texas General
Land Office**



**David Dewhurst
Commissioner**

November 26, 2002

Ms. Carolyn Murphy
Chief, Environmental Section
P.O. Box 1229
Galveston Texas, 77553

Re: Coastal Lease No. 20020005
City of Corpus Christi

Dear Ms. Murphy:

Enclosed is a copy of the referenced lease contract authorizing the use of coastal public land by the City of Corpus Christi, Texas for the purpose of opening the Packery Channel to the Gulf of Mexico, and for other associated purposes.

If you have any questions, please call me at (512) 463-5251.

Sincerely,


Jim Crow
Lease Manager

Encl:

Stephen F. Austin Building

1700 North
Congress Avenue

Austin, Texas
78701-1495

512-463-5001

The State of Texas



Austin, Texas

COASTAL LEASE NO. CL20020005

STATE OF TEXAS

§

KNOW ALL BY THESE PRESENTS:

COUNTY OF NUECES

§

§

This Coastal Lease No. CL20020005 (the "Agreement") is issued by virtue of the authority granted in Chapters 33 and 51, TEX. NAT. RES. CODE ANN. and Title 31, TEX. ADMIN. CODE, Chapters 13 and 155 and all amendments thereto, and all other applicable statutes and rules, as the same may be promulgated and/or amended from time to time.

ARTICLE I. PARTIES

1.01. In consideration of the mutual covenants and agreements set forth herein, the STATE OF TEXAS, acting by and through the School Land Board and its Chairman, David Dewhurst, Commissioner of the General Land Office, and David Dewhurst in his capacity as Commissioner of the General Land Office (the "State"), hereby authorizes City of Corpus Christi (the "Lessee") whose address is PO Box 9277, Corpus Christi, TX 78469-9277, to use the "Premises" (defined below) for the purposes identified in Article V below.

ARTICLE II. PREMISES

2.01. The coastal public land Lessee may use is described as follows:

A 684.480 acre portion of State Tracts Numbers 51, 60, 61, Laguna Madre; 907S, 908S, 915S, 916S Gulf of Mexico; and Tracts Numbers 1, 4, and 5, GLO School File No. 153534, Nueces County, Texas (the "Premises"). The Premises are shown on Vicinity Maps Exhibits A-1, A-2, B-1 and B-2 and described on Exhibits C-1, C-2, and F, attached hereto and incorporated herein by reference.

2.02. Lessee acknowledges and agrees that when any authorized improvements are placed on the Premises, the location of such improvements shall thereby become fixed at such location and shall not be changed except by a written amendment to this Agreement.

2.03. LESSEE HAS INSPECTED THE PHYSICAL AND TOPOGRAPHIC CONDITION OF THE PREMISES AND ACCEPTS THE SAME "AS IS", IN ITS EXISTING PHYSICAL AND TOPOGRAPHIC CONDITION. THE STATE DISCLAIMS ANY AND ALL WARRANTIES OF HABITABILITY, MERCHANTABILITY, SUITABILITY, FITNESS FOR ANY PURPOSE, AND ANY OTHER WARRANTY WHATSOEVER NOT EXPRESSLY SET FORTH IN THIS AGREEMENT. THE STATE AND LESSEE HEREBY ACKNOWLEDGE AND AGREE THAT USE OF THE TERM "GRANT" IN NO WAY IMPLIES THAT THIS AGREEMENT IS FREE OF LIENS, ENCUMBRANCES AND/OR PRIOR RIGHTS. NOTICE IS HEREBY GIVEN TO LESSEE THAT ANY PRIOR GRANT AND/OR ENCUMBRANCE MAY BE OF RECORD AND LESSEE IS ADVISED TO EXAMINE THE RECORDS IN THE ARCHIVES AND RECORDS DIVISION OF THE GENERAL LAND OFFICE, 1700 NORTH CONGRESS AVENUE, AUSTIN, TEXAS 78701-1495, AND ALL RECORDS OF THE COUNTY IN WHICH THE PREMISES ARE LOCATED. LESSEE IS NOT RELYING ON ANY REPRESENTATION OR WARRANTY OF THE STATE REGARDING ANY ASPECT OF THE PREMISES, BUT IS RELYING ON LESSEE'S OWN INSPECTION OF THE PREMISES.

ARTICLE III. TERM

3.01. This Agreement is for a period of ninety-nine (99) years, beginning on December 1, 2002, and ending on November 30, 2101, unless renewed or terminated as provided herein, provided, however: 1) in the event the channel dredging, bulkhead and jetty construction, and other improvements to be done in accordance with the requirements of Section 5.02(A)(3) are not completed on or before the tenth (10th) anniversary of this Agreement, the State may terminate this Agreement at any time thereafter by sending written notice of termination to Lessee in accordance with the terms of this Agreement, and 2) upon the expiration of a period of sixty (60) years of the nine-nine (99) year term of this Agreement, unless terminated earlier, the State may terminate this Agreement at any time by sending written notice of termination to Lessee in accordance with the provisions of this Agreement, no later than one (1) year prior to the effective date of termination.

ARTICLE IV. CONSIDERATION AND TAXES

4.01. A. As consideration for the right to use the Premises, Lessee agrees to pay the State as Rent, thirty-seven and one-half percent (37.5%) of all Gross Revenues received by Lessee under this lease as a result of or arising out of its use of the Premises. "Gross Revenues" shall mean all consideration received by Lessee and derived from all operations at or from the Premises (excluding sales tax, alcoholic beverage tax, or approved beach user fees as described in subsection B of this section, but shall not be reduced by any other amount, including without limitation, any allowance for debt service or any future bad debts), which would be determined by consistent application of generally accepted accounting principles, as promulgated and modified from time to time by the American Institute of Certified Public Accountants (AICPA) and as modified to industry standard practices. Gross Revenue includes but is not limited to, entrance and parking fees, revenues from concessionaires, sublessees, licensees, permittees, and other consideration, regardless of whether such consideration is received as rent, commission, fees, a percent of sales or any other form. Lessee acknowledges and agrees that it is the intent of the parties hereto that the Premises, other than the Channel itself, be developed in a commercially reasonable manner, with all operations and uses, whether by Lessee, its sublessees, concessionaires, licensees, permittees, or others, to be structured with rentals on a market rate basis. Consistent with this express intent, Lessee shall develop and prepare a written plan for the commercial development of the Premises ("Development Plan") and shall submit the proposed Development Plan to the State for approval not later than the completion of the Channel dredging. The Development Plan shall include a timeline for completion of minimum improvements. The State's approval of the Development Plan shall not be unreasonably withheld, provided the Development Plan conforms to the intent of the parties as above expressed. No development of the Premises shall occur prior to approval of the Development Plan and, after approval, Lessee shall continually use its best efforts to maximize Gross Revenues with the Development Plan.

The Rent shall be calculated from Gross Revenues received by Lessee for each calendar year or portions thereof during the term of this Agreement, and shall be payable not later than March 1st of the immediately following calendar year. The requirement to pay Rent on March 1st, for the previous calendar year survives the expiration or termination of this Agreement.

B. Lessee shall not impose or collect beach user fees as that term is defined in Title 31, Texas Administrative Code, Chapter 15, as amended, unless such fees are approved in advance in writing by the State. Upon approval by the State of the imposition of beach user fees, Lessee shall retain and expend approved beach user fees in accordance with the Texas Open Beaches Act, Tex. Nat. Res. Code, Chapter 61, and Title 31, Texas Administrative Code, Chapter 15, as amended from time to time.

4.02. Lessee shall have the following duties with respect to reporting and verification of Rent payable:

A. Lessee shall at all times keep orderly, timely, and accurate accounting books and records of the Gross Revenues, and such records shall be kept in a form and substance that is auditable by an independent certified public accountant.

B. Together with the payment of Rent, Lessee shall, on the Rent due date, provide the State with a report in affidavit form showing the applicable Gross Revenues, accruing to the rental period for which Rent is being paid (the "Rent Report"). The Rent Report shall be due whether Rent is owed under Section 4.01, or not. The Rent Report shall be in a form and substance that is reasonably acceptable to the State and that is otherwise verifiable by a "Special Report Relating to Amount of Sales for the Purpose of Computing Rental", as such term or similar term is used in publications of the AICPA ("Special Report").

C. To the extent Lessee, or any approved sublessee, permittee, or licensee, in the normal conduct of business, has its accounting books audited by an independent certified public accountant, Lessee will cause, at no cost to the State, such auditor or auditors to include a Special Report detailing Gross Revenues received as described in Section 4.01 of this Agreement, covering the same time period(s) as the audit and shall furnish such Special Report to the State immediately upon its completion. If Lessee does not have its accounting books audited in the regular course of its business, then the State, by written notice to Lessee, may require Lessee to obtain, at Lessee's sole cost and expense, a Special Report. However, the State may not require such Special Report more often than once in each Five Year Period that this Agreement is in effect and such request shall be limited to coverage of the preceding Five Year Period of Lessee's operations at the Premises.

D. If an underpayment of Rent is found or confirmed by an auditor's Special Report, then Lessee shall, within ten (10) days after the date of the Special Report, submit to the State amended Rent Report(s) and any amounts due thereunder together with any late fee (as described in Section 4.03 of this Agreement) due thereon. If such underpayment exceeds ten percent (10.0%) for any single year covered by a Special Report or exceeds fifteen percent (15.0%) in total for any five year period, then the State may require, in its sole discretion, Lessee to obtain, at Lessee's sole cost and expense, Special Reports annually. Lessee shall also take immediate steps to correct any deficiency in Lessee's accounting systems and procedures that shall have been the cause of the underpayment. If, however, there is a discrepancy in favor of the State, such discrepancy shall be considered prepayment of future Rent due, if any, but in no event shall this provision ever require the State to remit a cash refund to Lessee.

4.03. All Rent and any other sums due by Lessee shall be due and payable by Lessee without demand, deduction, abatement, or offset. Past due Rent and other past due payments shall bear interest from maturity at the rate of ten percent (10%) per annum from the date when due until actually paid.

4.04. In addition to the above, Lessee shall pay and discharge any and all taxes, general and special assessments, and other charges which during the term of this Agreement may be levied on or assessed against the Premises or any improvements constructed or installed thereon (the "Taxes"). Lessee shall pay such Taxes at least five (5) days prior to the date of delinquency directly to the authority, official or entity charged with collection. Lessee may, in good faith and at its sole cost and expense, contest any Tax and shall be obligated to pay the contested amount only if and when finally determined to be owed.

ARTICLE V. USE OF THE PREMISES

5.01. A. In connection with Lessee's use of the Premises, Lessee may construct and/or maintain the following: uplands and submerged lands containing approximately 684.480 acres to be used as a public park and dredged channel including, without limitation, amenities, public parking, bait and tackle sales, food and beverage sales, convenience stores, beach amenities (such as suntan lotion, umbrellas, beach chairs, and surfboards), boat launching, piers and docks, watercraft rentals, boat and trailer storage, fuel sales, recreational vehicle park and all associated amenities and services, shoreline stabilization, maintenance areas, bulkheads, jetties, beach nourishment, and dredge material disposal (collectively, the "Improvements"). Lessee shall not use the Premises for any other purpose without prior written consent from the State, which consent may be granted or withheld in the State's sole discretion. Lessee is specifically prohibited from using or permitting the use of the Premises for any illegal purpose. Provided the State does not unreasonably interfere with Lessee's use of the Premises, the State may use or permit the use of the Premises for any purpose consistent with Lessee's use of the Premises; however, it is understood that the State does not intend to and will not compete with the operations or uses of the Premises by Lessee under this Agreement.

B. Not later than sixty days prior to commencement of construction or installation of any Improvements, including but not limited to paving, sanitary facilities, offices, recreational buildings, or other structures, Lessee shall submit complete plans and specifications to the State for review and written approval. The State shall review and approve, reject, or require such revisions as it may choose, in writing, within sixty days of receipt of the submitted plans and specifications. The Deputy Commissioner for the Asset Inspection Division of the Texas General Land Office or his successor, or other person designated in writing by the State, is authorized to review, approve, reject, or require revisions to plans and specifications on behalf of the State.

C. Lessee shall comply, and cause its officers, employees, agents, representatives, contractors and invitees to comply, with applicable laws, ordinances, rules and regulations of all governing authorities with jurisdiction over the Premises. Lessee is specifically notified of its need to comply with laws and regulations, including Texas Natural Resources Code Chapter 33, Subchapter F. "Coastal Coordination Act", enacted for the purpose of protecting and preserving public lands and waters.

D. Lessee shall permit the State's agents, representatives, and employees to enter into and on the leased premises at all reasonable times for the purpose of inspection and any other reasonable purpose necessary to protect the State's interest in the leased Premises.

E. Lessee may not charge any holder of a valid mineral lease or other grant of interest from the State for surface damages for the use of the leased Premises. All such damage payments shall be made directly to the State. Lessee, however, may seek compensation for damages to personal property or the Improvements, to the extent allowed by law, in an action against the holder of a valid mineral lease or other grant-of-interest issued by the State. This damage limitation in no way limits the liability of third parties in an action at law for damages inflicted upon Lessee by acts of negligence.

F. Except as otherwise provided herein, Lessee shall have the right to file a criminal complaint or institute civil proceedings to protect Lessee's right of possession and leasehold interest in the leased Premises.

G. Lessee shall use the highest degree of care and all appropriate safeguards to prevent pollution of air, ground and water in and around the Premises, and to protect and preserve natural resources and wildlife habitat. In the event of pollution of or damage to natural resources in or around the Premises which is the result of an act or omission of Lessee, its officers, employees, agents, representatives, contractors, concessionaires, and/or invitees, Lessee shall immediately notify the State and undertake all required and appropriate action to remedy the same. To the extent permitted by law, Lessee shall be liable for all damages and/or mitigation to the Premises and public lands and waters as a result of such act or omission. In the event of termination of this Lease, Lessee's obligations under this Section 5.01.G. shall survive any such termination of the Lease.

H. LESSEE IS EXPRESSLY PLACED ON NOTICE OF THE NATIONAL HISTORICAL PRESERVATION ACT OF 1966, (PB-89-66, 80 STATUTE 915; §470) AND THE ANTIQUITIES CODE OF TEXAS, CHAPTER 191, TEX. NAT. RES. CODE ANN. AND ALL AMENDMENTS THERETO. IN THE EVENT THAT ANY SITE, OBJECT, LOCATION, ARTIFACT OR OTHER FEATURE OF ARCHEOLOGICAL, SCIENTIFIC, EDUCATIONAL, CULTURAL OR HISTORIC INTEREST IS ENCOUNTERED DURING THE ACTIVITIES AUTHORIZED BY THIS AGREEMENT, LESSEE WILL IMMEDIATELY CEASE SUCH ACTIVITIES AND WILL IMMEDIATELY NOTIFY THE STATE AND THE TEXAS HISTORICAL COMMISSION, P.O. BOX 12276, AUSTIN, TEXAS 78711, SO THAT ADEQUATE MEASURES MAY BE UNDERTAKEN TO PROTECT OR RECOVER SUCH DISCOVERIES OR FINDINGS, AS APPROPRIATE.

5.02. A. Lessee's use of the Premises is subject to compliance with the following covenants, obligations and conditions (the "Special Conditions"):

1. The Lessee acknowledges that its dredging and construction activities in the Packery Channel beneath and adjacent to Park Road 22 (the Kennedy Causeway) are subject to an easement for highway purposes held by the Texas Department of Transportation (TxDOT), which easement contains highway facilities including bridges, piers/columns, embankments, drainage areas and roadway surfaces. The Lessee's work shall be consistent with

the safety, maintenance, and operation of the highway facilities at all times and shall not interfere with TxDOT use of the easement nor endanger TxDOT facilities or create a hazard to public users. The Lessee's work shall be accomplished in such manner as to cause no reduction in level of service of the highway facilities or interference with TxDOT inspection, construction, maintenance and/or operation of same. To the extent permitted by law, Lessee shall be liable for any injuries or damages arising from any dredging, construction, or other activities by Lessee, its employees, agents, or contractors within the easement.

2. The Lessee will furnish to the TxDOT Corpus Christi District Engineer at 1701 So. Padre Island Drive, Corpus Christi, Texas 78416, two sets of complete plans, details and specifications, including work schedules, for its work within and immediately adjacent to the TxDOT right of way easement, and no work will be done without prior written approval of such plans by TxDOT. During the course of the work, any material changes or alterations must also be submitted to the District Engineer for prior approval. All construction work is to be done in conformity with the plans and specifications as approved. The Lessee will provide to the District Engineer a minimum of 48 hours written notice prior to commencement of work within or immediately adjacent to the right of way easement. TxDOT, its employees, agents and/or representatives have the right to inspect work within the right of way easement at any time during the progress of such work.
3. All dredging, bulkhead and jetty construction, and other improvements to the Premises shall be done in accordance with the U.S. Army Corps of Engineers *North Padre Island Storm Damage Reduction and Environmental Restoration Project, Packery Channel, Texas, Specifications for Dredging*.
4. All mitigation for impacts to seagrass, marshes, tidal flats, and algal mats on or adjacent to the Premises shall be done in accordance with the *North Padre Island Storm Damage Reduction and Environmental Restoration Project, Packery Channel, Texas, Environmental Impact Statement* and the *North Padre Island Storm Drainage Reduction and Environmental Restoration Project Mitigation Plan* attached hereto as Exhibit "E". If any mitigation provision of the *Environmental Impact Statement* conflicts with the *Mitigation Plan* in such a manner that the two cannot be harmonized, the *Mitigation Plan* shall control unless otherwise agreed to in writing by both parties. Failure to successfully complete any required mitigation shall constitute an event of default under this Agreement.
5. All mitigation for impacts to the Mollie Beattie Habitat Community shall be done in accordance with the *Memorandum of Understanding Regarding the Monitoring of the Mollie Beattie Coastal Habitat Community and Molly Beattie Methodology* attached to this Agreement as Exhibits "D-1" and "D-2" and incorporated by reference herein.
6. All work, Improvements under Section 5.01, or other activities by Lessee, or its approved sublessees, licensees, or permittees, within the leased Premises shall be done in accordance with the Texas Open Beaches Act, Tex. Nat. Res. Code, Chapter 61, the Texas Dune Protection Act, Tex. Nat. Res. Code, Chapter 63, and the Texas General Land Office Beach/Dune Rules, Title 31, Texas Administrative Code, Chapter 15, all as amended from time to time.
7. Navigation aids, consistent with U.S. Coast Guard guidance, shall be installed and maintained by the Lessee upon completion of construction.
8. Canal depths for recreational craft shall not exceed fourteen (14) feet below mean low water and shall be no deeper than is necessary for navigation.
9. Lessee must notify the General Land Office, in writing, at least thirty (30) days prior to modification, rebuilding, major repair, or removal of any structure authorized in this Agreement unless such action is related to termination of the Agreement. Notice of removal shall be provided as specified in Article IX. of this Agreement.
10. Lessee shall notify the General Land Office in writing at least two (2) weeks prior to commencing dredging operations and within one (1) week following completion of the work.

11. Lessee shall notify the General Land Office in writing at least sixty (60) days prior to undertaking any maintenance dredging activities occurring during the term of this Agreement.
12. All dredged material (spoil) authorized by this Agreement shall be placed at the locations and configurations as shown on Exhibits "F" and "C-2" and as required by the Final Environmental Impact Statement.
13. Lessee is required to perform mitigation and/or pay surface damage fees according to the State's policy in effect at the time damages occur for any and all surface damages resulting from the actions of Lessee, Lessee's employees, representatives, agents, or contractors, and any sublessees, permittees, or licensees during the term of this Agreement. Such mitigation and/or payment of damage fees shall be performed in the manner and within the timeframe specified in the written notice provided by the State to Lessee following said damages. The obligation to mitigate and/or pay surface damage fees pursuant to this subsection does not apply to the same damages that are subject to mitigation pursuant to Section 5.02(A)(4) of this Agreement.

B. Prior to undertaking construction or installation of Improvements on the Premises, Lessee shall provide written notice of the terms of this Agreement, including the Special Conditions, to each person or entity authorized by Lessee to perform any such activity on its behalf. Lessee shall retain a copy of each such written notice provided to its agents, representatives, employees, and/or contractors under this provision and, if a dispute arises concerning construction or installation of the Improvements, Lessee shall provide the State with a copy of all applicable notices within ten (10) days of the State's written request. Lessee's failure to maintain and provide each required written notice shall constitute a default under this Agreement.

5.03. If Lessee or its approved sublessees, permittees, or licensees, fails to maintain and/or repair Improvements in good condition and repair, such failure shall constitute a default under this Agreement and the State may, at its option, terminate this Agreement upon written notice to Lessee or pursue a remedy under Section 51.3021, TEX. NAT. RES. CODE ANN. and all amendments thereto. If Lessee constructs improvements other than those authorized in Article V, such improvements shall constitute illegal structures and the State may, at its option, terminate this Agreement or pursue a remedy under Section 51.302, et seq., TEX. NAT. RES. CODE ANN. and all amendments thereto.

ARTICLE VI. ASSIGNMENTS AND SUBLEASES

6.01.A. LESSEE SHALL NOT ASSIGN THIS AGREEMENT OR THE RIGHTS GRANTED HEREIN, IN WHOLE OR PART, TO ANY THIRD PARTY FOR ANY PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF THE STATE, WHICH MAY BE GRANTED OR WITHHELD IN THE STATE'S SOLE DISCRETION. ANY UNAUTHORIZED ASSIGNMENT SHALL BE VOID AND OF NO EFFECT, AND SUCH ASSIGNMENT NOT RELIEVE LESSEE OF LIABILITY UNDER THIS AGREEMENT.

6.01.B. LESSEE MAY SUB-LEASE, LICENSE, OR PERMIT THE USE OF THE PREMISES WITH PRIOR WRITTEN APPROVAL BY THE STATE, WHICH APPROVAL MAY BE GRANTED OR WITHHELD AT THE STATE'S SOLE DISCRETION, OR UPON SUCH CONDITIONS AS THE STATE MAY IN ITS SOLE DISCRETION DEEM REASONABLY NECESSARY TO PROTECT THE PUBLIC INTEREST, INCLUDING BUT NOT LIMITED TO, RENTAL REQUIREMENTS, REQUIREMENTS TO PROVIDE FOR INDEMNIFICATION OF THE STATE, INSURANCE REQUIREMENTS, REMOVAL OF TRASH AND DEBRIS, PUBLIC ACCESS TO THE LEASE PREMISES, AND PROTECTION OF THE NATURAL ENVIRONMENT. THE STATE SHALL BE PROVIDED WITH COPIES OF ANY SUBLEASE, LICENSE, OR PERMIT FOR THE USE OF THE PREMISES, INCLUDING ANY AMENDMENTS THERETO, PRIOR TO APPROVAL BY THE STATE. THE DEPUTY COMMISSIONER FOR THE ASSET INSPECTION DIVISION OF THE TEXAS GENERAL LAND OFFICE, OR HIS SUCCESSOR OR OTHER PERSON DESIGNATED IN WRITING BY THE STATE, IS AUTHORIZED TO APPROVE OR REJECT ANY SUBLEASE, LICENSE, OR PERMIT, OR REQUIRE CONDITIONS, ON BEHALF OF THE STATE

6.02 EXCEPT TO THE EXTENT SPECIFICALLY PROVIDED BY TEX. NAT. RES. CODE §61.022, LESSEE AND ANY APPROVED SUBLESSEE, LICENSEE, OR PERMITTEE SHALL NOT IN ANY MANNER RESTRICT THE

PUBLIC FROM FREE ACCESS TO AND USE OF THE PUBLIC BEACH AND TO THE WATERS OF THE GULF OF MEXICO, AS REQUIRED BY THE TEXAS OPEN BEACHES ACT. ALL PERSONS SHALL HAVE THE RIGHT TO BRING TO AND USE THEIR OWN PERSONAL PROPERTY AND EQUIPMENT ON THE PUBLIC BEACH, INCLUDING BUT NOT LIMITED TO, UMBRELLAS AND CHAIRS, REGARDLESS OF WHETHER THE PERSONAL PROPERTY OR EQUIPMENT CONSISTS OF ITEMS SOLD OR RENTED BY THE SUBLESSEE, LICENSEE, OR PERMITTEE. SUBLEASES, LICENSES, AND PERMITS MAY GIVE THE SUBLESSEE, LICENSEE, OR PERMITTEE THE EXCLUSIVE RIGHT TO CONDUCT BUSINESS AT SPECIFIED SITES OR BEACH LOCATIONS, SUBJECT TO THE LIMITATIONS OF THIS SUBSECTION.

6.03 LESSEE MAY, UPON OBTAINING THE WRITTEN APPROVAL OF THE STATE, AND SUBJECT TO SUCH RESTRICTIONS AND LIMITATIONS AS THE STATE MAY PRESCRIBE, SET ASIDE AREAS OF THE PREMISES TO BE USED FOR THE SAFE OPERATION OF VESSELS, INCLUDING LAUNCHING AND RECOVERY AREAS FOR PERSONAL WATERCRAFT, SAILBOATS, WINDSURF BOARDS, AND KITE SAIL BOARDS.

ARTICLE VII. INDEMNITY

7.01. TO THE EXTENT PERMITTED BY LAW, LESSEE AGREES TO INDEMNIFY AND HOLD THE STATE, ITS SUCCESSORS, ASSIGNS, OFFICERS, AGENTS, REPRESENTATIVES, CONTRACTORS AND EMPLOYEES (THE "INDEMNIFIED PARTIES") HARMLESS FROM AND AGAINST ALL CLAIMS, PROCEEDINGS, ACTIONS, DAMAGES, JUDGMENTS, LIABILITIES, AWARDS AND EXPENSES WHATSOEVER, INCLUDING STRICT LIABILITY CLAIMS (THE "CLAIMS") WITHOUT LIMIT AND WITHOUT REGARD TO THE CAUSE OR CAUSES THEREOF OR THE NEGLIGENCE OF THE INDEMNIFIED PARTIES, THAT MAY BE BROUGHT, INSTITUTED OR AWARDED ON ACCOUNT OF OR GROWING OUT OF ANY AND ALL INJURIES OR DAMAGES, INCLUDING DEATH, TO PERSONS OR PROPERTY RELATING TO OR RESULTING FROM, DIRECTLY OR INDIRECTLY: (I) ANY OCCURRENCE IN, UPON, AT OR FROM THE PREMISES OR ANY PART THEREOF, OR (II) THE USE OR OCCUPANCY OF THE PREMISES OR ANY PART THEREOF, TOGETHER WITH ANY AND ALL LOSSES THERETO, INCLUDING, WITHOUT LIMITATION, ALL COSTS OF DEFENDING AGAINST, INVESTIGATING AND SETTLING THE CLAIMS. IT IS THE EXPRESSED INTENTION OF THE PARTIES HERETO THAT THE INDEMNITY PROVIDED FOR IN THIS SECTION 7.01 IS AN INDEMNITY BY LESSEE TO INDEMNIFY AND PROTECT THE INDEMNIFIED PARTIES FROM THE CONSEQUENCES OF THE INDEMNIFIED PARTIES' OWN NEGLIGENCE WHERE THAT NEGLIGENCE IS A CONCURRING CAUSE OF THE CLAIM. THIS INDEMNITY SHALL HAVE NO APPLICATION TO ANY CLAIM WHERE THE CLAIM RESULTS FROM THE SOLE NEGLIGENCE OF THE STATE. LESSEE'S OBLIGATION OF INDEMNITY SET FORTH HEREIN SHALL SURVIVE EXPIRATION OF THIS AGREEMENT.

ARTICLE VIII. DEFAULT, TERMINATION AND EXPIRATION

8.01. If Lessee fails or refuses to remedy a default under this Agreement within thirty (30) days of the State's written notice specifying such default, the State may terminate this Agreement by sending written notice of termination to Lessee in accordance with Article IX. Upon the effective date of such notice, this Agreement shall terminate and neither party shall have any further rights or obligations except for those accruing prior to the effective date of termination and/or those which specifically survive termination of this Agreement.

8.02. Unless waived in writing by the State prior to termination of this Agreement, Lessee shall, within one hundred twenty (120) days from the termination date, remove all personal property, structures and improvements, whether the Lessee's or otherwise (including, without limitation, the Improvements) from the Premises and restore the Premises (and all other property affected by Lessee's removal activities) to the same condition that existed prior to the placement, construction, or installation thereof on the Premises. Lessee's activities shall be conducted in accordance with General Land Office guidelines in effect at the time of such activity, including, without limitation, specific techniques required for protection of natural resources and mitigation, or payment in lieu of mitigation, for damages resulting from removal activity. Upon such termination Lessee shall notify the State in writing within ten (10) days following completion of Lessee's removal and restoration activity. Lessee's obligations to perform or undertake any specific activity under this Agreement, including the foregoing removal provision, shall survive termination of this Agreement.

ARTICLE IX. NOTICE AND INFORMATION REQUIREMENTS

9.01. A. Any notice given under the terms of this Agreement shall be in writing and either delivered by hand, by ~~facsimile or sent by United States first-class mail~~, adequate postage prepaid, if for the State, to Deputy Commissioner, Asset Inspection, 1700 North Congress Avenue, Austin, Texas 78701-1495, and if for Lessee, to City of Corpus Christi, PO Box 9277, Corpus Christi, TX 78469-9277. Any party's address may be changed from time to time by such party by giving notice as provided above, except that the Premises may not be used by Lessee as the sole notice address. No change of address of either party shall be binding on the other party until notice of such change of address is given as herein provided.

B. For purposes of the calculation of various time periods referred to in this Agreement, notice delivered by hand shall be deemed received when delivered to the place for giving notice to a party referred to above. Notice mailed in the manner provided above shall be deemed completed upon the earlier to occur of (i) actual receipt as indicated on the signed return receipt, or (ii) three (3) days after posting as herein provided.

9.02. Lessee shall provide written notice to the State of any change in Lessee address within ten (10) business days of such change.

9.03. Lessee shall provide the State with information reasonably requested in writing within thirty (30) days of such request.

ARTICLE X. MISCELLANEOUS PROVISIONS

10.01. Neither acceptance of Consideration or any other sum payable under this Agreement (or any portion thereof) by the State, nor failure by the State to complain of any act or omission of Lessee, shall constitute a waiver by the State of its rights under this Agreement. Waiver by the State of any covenant, duty or obligation of Lessee under this Agreement shall be in writing and signed by a duly authorized representative of the State. Waiver by the State shall be limited to the act or omission specified in writing and shall not constitute a waiver of any other covenant, duty or obligation of Lessee under this Agreement, whether of the same or different subject matter.

10.02. All monetary obligations of the State and Lessee (including, without limitation, any monetary obligation for damages for any breach of the respective covenants, duties or obligations of either party hereunder) are performable exclusively in Austin, Travis County, Texas.

10.03. This instrument, including exhibits, constitutes the entire agreement between the State and Lessee and no prior written or oral or contemporaneous oral promises, warranties or representations shall be binding. This Agreement shall not be amended except by written instrument signed by the State and Lessee.

IN TESTIMONY WHEREOF, witness my hand and the Seal of Office.

THE STATE:
THE STATE OF TEXAS

By: David Dewhurst
David Dewhurst
Commissioner, General Land Office
Chairman, School Land Board

Date: 11-25-2002

APPROVED:

Contents: [Signature]
Legal: [Signature]
Deputy: [Signature]
Executive: [Signature]

LESSEE:
City of Corpus Christi

By: [Signature]
(Signature)
DAVID GARETS
(Printed Name)

CITY MANAGER
(Title)

Date: 11-13-02

Approved as to form:
James R. Bray, Jr.
City Attorney

By: [Signature]
R. Jay Reining
Assistant City Attorney

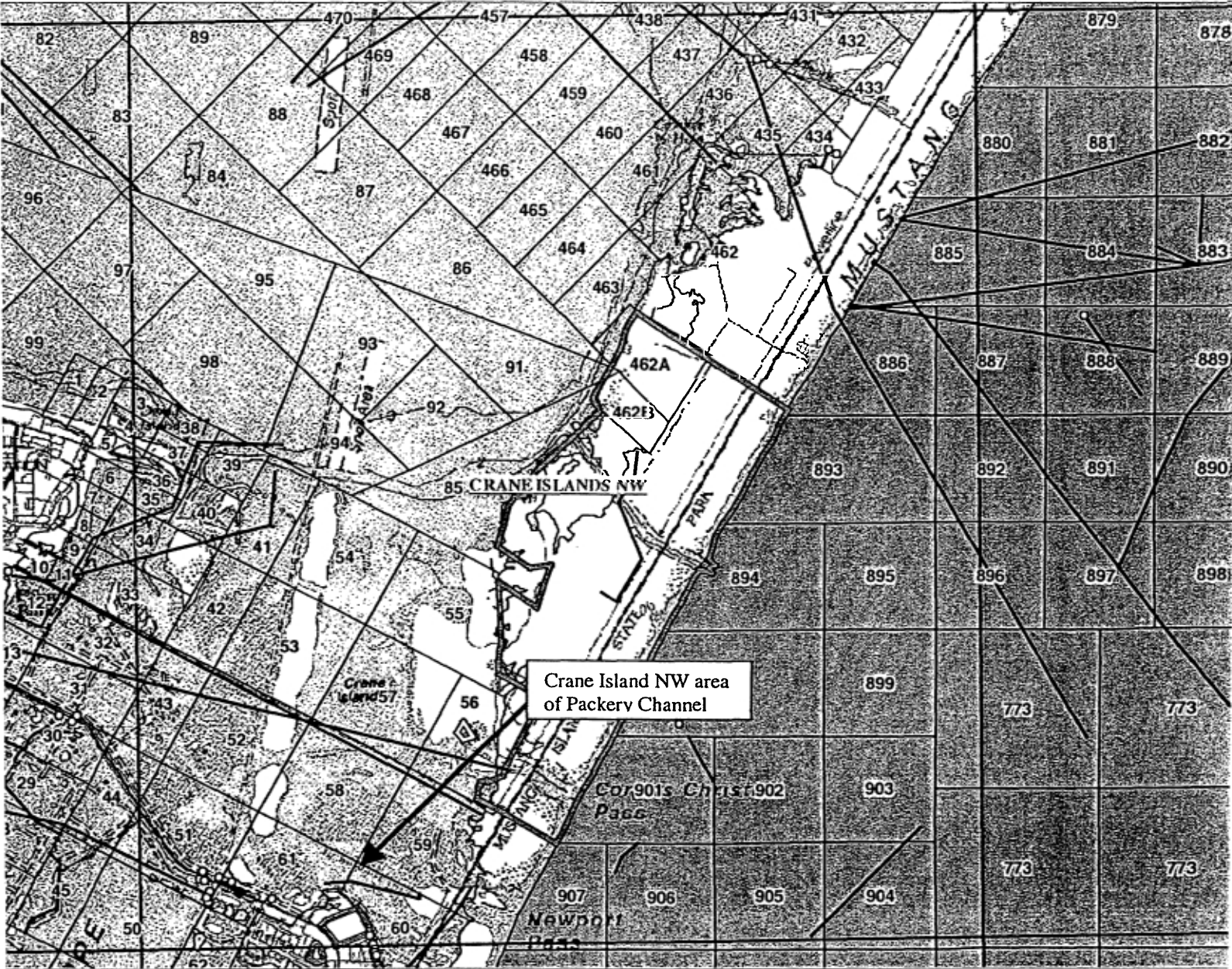


EXHIBIT A-1
City of Corpus Christi
CL20020005

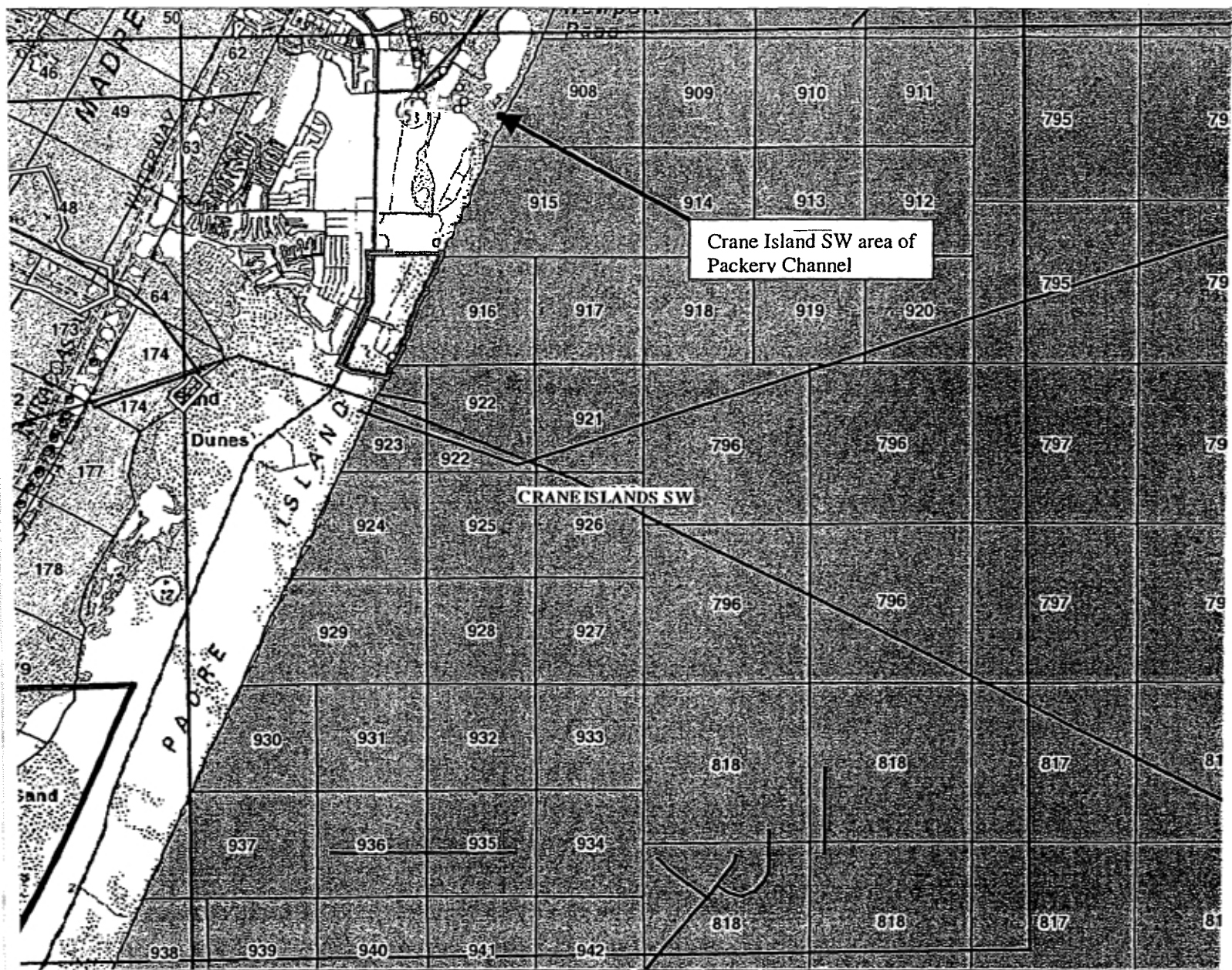


EXHIBIT A-2
City of Corpus Christi
CL20020005

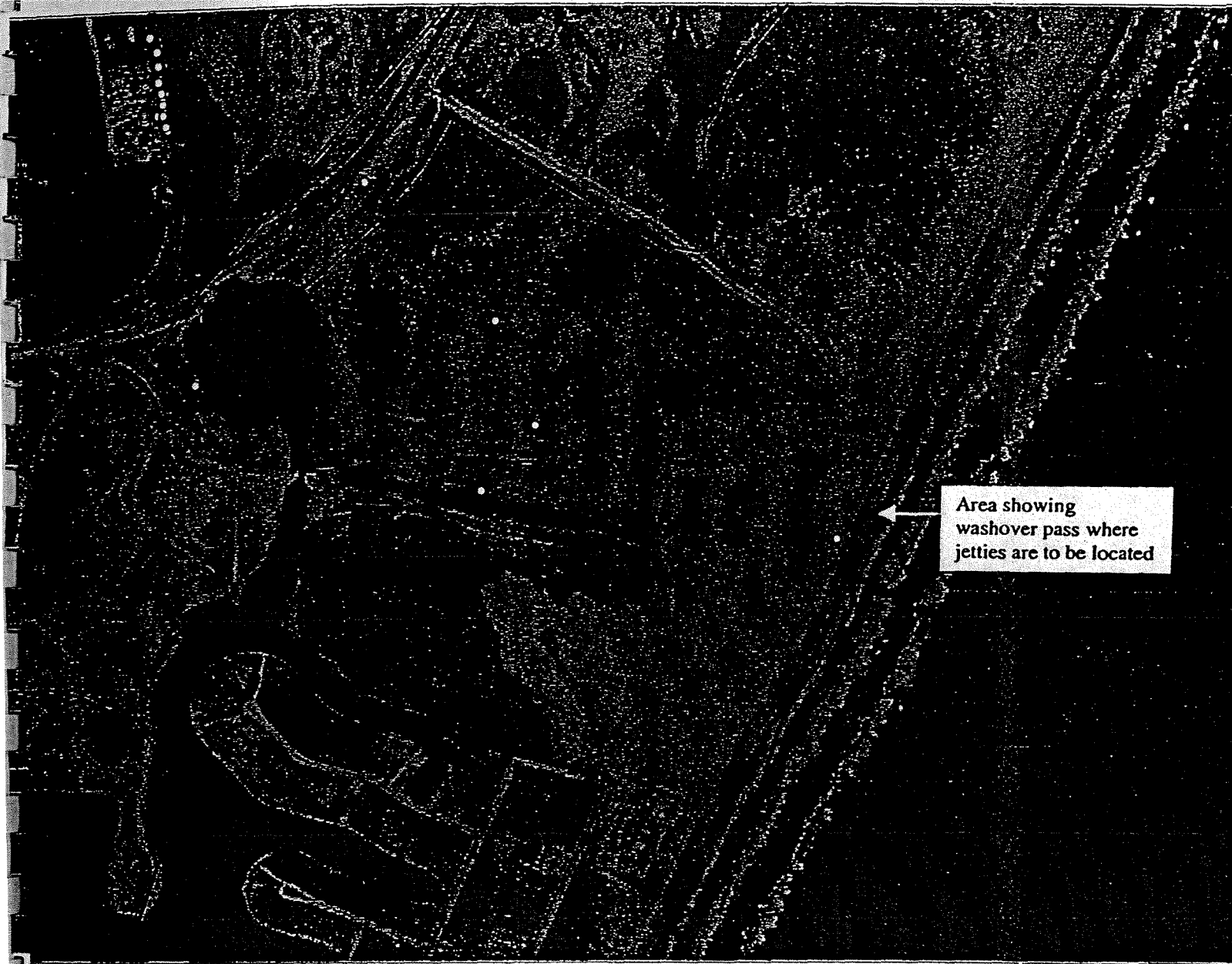


EXHIBIT B-1
City of Corpus Christi
CL20020005

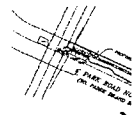
61

Dredge Material
placement area

Reach 2 of Packery
project (from Hwy 361 to
Intracoastal Waterway)

EXHIBIT B-2

City of Corpus Christi
CL20020005



GULF OF MEXICO

SEE SHEET 1 OF 2

POINT OF BEGINNING

STATE HIGHWAY NO. 361

FILE & ASSOCIATES, INC.

231 AC. OUT OF 280.25 AC TRACT
OUT OF THE WILLIAM BRYAN SURVEY NO. 806, L.S. 64
AND ADJACENT TO TRACT 1

143.00 AC. OUT OF THE
WILLIAM BRYAN SURVEY NO. 806, L.S. 64
AND ADJACENT TO TRACT 1

TRACT 2

TRACT NO. 2
CALLED 342.733 AC
NEW ADJACENT TO TRACT 1
AND TO TRACT 3

TRACT 3

TRACT NO. 3
CALLED 342.733 AC
NEW ADJACENT TO TRACT 1
AND TO TRACT 2

TRACT 4

TRACT NO. 4
CALLED 342.733 AC
NEW ADJACENT TO TRACT 1
AND TO TRACT 3

TRACT 5

TRACT NO. 5
CALLED 342.733 AC
NEW ADJACENT TO TRACT 1
AND TO TRACT 3

STATE OF TEXAS
GULF OF MEXICO

NOTE:

1. ALL PROPERTY - WHEN ADJACENT TO THE GULF OF MEXICO, THE CENTER OF GRAVITY OF THE EARTH SHALL BE USED IN ALL CALCULATIONS.
2. ALL PROPERTY - WHEN ADJACENT TO THE GULF OF MEXICO, THE CENTER OF GRAVITY OF THE EARTH SHALL BE USED IN ALL CALCULATIONS.
3. THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE BOARD OF LAND SURVEYORS OF THE STATE OF TEXAS.

SURVEY OF

SIX TRACTS OF STATE OWNED UPLAND AND SUBMERGED LANDS
COMPRISING 370.794 ACRES OUT OF GULF OF MEXICO STATE
TRACTS NO. 815 AND 816, 132.223 ACRES OUT OF LAGUNA
MARINE STATE TRACTS 31, 60 AND 61, 2,008 ACRES OUT OF THE
RIGHT OF WAY OF STATE HIGHWAY NO. 361 AND 138.445 ACRES OUT
OF THOSE CERTAIN TRACTS OF LAND DESIGNATED AS TRACTS 1, 2, 3, 4
AND 5 AND DESCRIBED IN FINAL ADJUDICATION OF THE 28TH JUDICIAL
DISTRICT COURT, CAUSE NO. 115,340-A, MUECES COUNTY, TEXAS.

SHEET 2 OF 2
DATE: FEBRUARY 12, 2007

FILE & ASSOCIATES, INC.
PROFESSIONAL LAND SURVEYORS
2007 STATE LICENSE NO. 11111
2007 STATE LICENSE NO. 11111
2007 STATE LICENSE NO. 11111

SCALE IN FEET

I, George M. Pyle, LICENSED STATE LAND SURVEYOR, do hereby certify that
the foregoing plat and boundary survey was made by me or by the
person and that the same, boundaries and portions, natural and artificial
are as described herein.
George M. Pyle 9-05-07
George M. Pyle, R.L.S., 11756 L.S. 63
Received July 01, 2007: All Gulf District and Right-of-Way Statement
Received August 22, 2007: All State Surveyed Land Tracts
Received August 30, 2007: All State

EXHIBIT C-7

MEMORANDUM OF UNDERSTANDING REGARDING THE MONITORING OF THE MOLLIE BEATTIE COASTAL HABITAT COMMUNITY

The STATE OF TEXAS, acting by and through the School Land Board and its Chairman, David Dewhurst, Commissioner of the General Land Office (the "State") and the City of Corpus Christi (the "City") enter into this Memorandum of Understanding as follows:

Whereas, the United States Army Corps of Engineers (USACOE), as the Federal Agency, and the City, as the Local Sponsor, have undertaken the North Padre Island Storm Damage and Environmental Restoration Project (the Project), which was authorized and directed by the United States Congress in Public Law 106-53.

Whereas, the State owns that certain property on which the Project will be constructed, as described in Coastal Lease No. CL 20020005 between the State and the City.

Whereas, the Mollie Beattie Coastal Habitat Community (MBCHC), consists of approximately 1,110 acres of State-owned land contained in State Tracts 59 and 60.

Whereas, portions of the existing navigation channel that provides access from the Padre Isles subdivision to the Upper Laguna Madre run through the MBCHC.

Whereas, the tidal waters of the MBCHC, including the navigation channel, are navigable waters of the United States and are subject to the navigational servitude afforded under the Constitution and laws of the United States.

Whereas, the use of this channel by recreational vessels is anticipated to increase once the Project is completed and vessels are enabled to use the channel to access the Gulf of Mexico.

Whereas, the navigable channel will be enhanced and maintained through the project.

Whereas, under a 1996 MOU between the TGLO and U. S. Fish and Wildlife Service (USFWS), the MBCHC is managed under the MBCHC Management Plan by the MBCHC Management Team, which consists of representatives of the TGLO, USFWS, Texas Parks and Wildlife Department (TPWD), and the National Audubon Society (Audubon).

Whereas, consultants for the USACOE, who have extensively studied and modeled the Project area for the USACOE's Environmental Impact Statement for the Project, and the USACOE have determined to their satisfaction that the Project will not have any significant detrimental effects on the MBCHC based upon maintenance of a no wake zone, but some members of the MBCHC Management Team have expressed concerns that the Project may have some negative effects on the MBCHC.

Now therefore the City and TGLO are entering into this Memorandum of Understanding (MOU) to address these concerns, and agree as follows:

1. Purpose. The purpose of this agreement is to provide a mechanism to monitor any adverse effects that the Project might have on the MBCHC, determine any mitigation measures that may be needed, and to establish procedures for undertaking the mitigation measures.

2. MOU is an Interlocal Cooperation Agreement. This MOU is considered an agreement under the Texas Interlocal Cooperation Act, Chapter 791 of the Texas Government Code.

3. Establishment of Packery Channel Task Force.

a. The TGLO and City agree to establish a task force, to be known as the Packery Channel Task Force, to address issues related to the impacts on the MBCHC that are caused by the Project, including the increased use of the Packery Channel navigation channel. The Packery Channel Task Force shall consist of representatives from the TGLO, City, USACOE, plus any members of the MBCHC Management Team that the TGLO designates.

b. The Packery Channel Task Force will review the results of the monitoring activities conducted under this MOU, as the results become available.

4. Monitoring program. In order that any actual effects can be determined, the City, with the advice of the USACOE, agrees to undertake the monitoring program described in Attachment A, which is adopted and incorporated by reference into this agreement.

Any data from any City-provided reference site may be used only if acceptable to the TGLO, in its sole discretion. In determining whether the data or the reference site is acceptable to the TGLO, the TGLO may consider proximity of the reference site to the MBCHC or the Project, the hydrological and geophysical characteristics of the reference site, environmental similarities of the two sites, and/or any other factor that the TGLO considers appropriate.

5. City's Commitment to Mitigate Damages. The City agrees, to the extent permissible under State law, to undertake those actions necessary, as determined by the TGLO, after considering the recommendations of the Packery Channel Task Force, to counter, mitigate, and resolve any significant negative effects that are proximately caused by the Project, including, but not limited to, increased vessel traffic. The requirements of this section are in addition to and not in lieu of any additional mitigation responsibilities set forth in CL20020005 and/or the North Padre Island Storm Damage Reduction and Environmental Restoration Project, Packery Channel, Texas, Environmental Impact Statement.

6. City Solely Responsible to TGLO.

a. Under this MOU, the City is solely responsible to the TGLO for those requests for mitigation coming directly from the TGLO. The City is not responsible under this MOU for any request for mitigation made by any other entity, either individually or jointly.

b. Nothing in this agreement shall be interpreted to affect or lessen the City's obligations to the USACOE under the City's Project Construction Agreement with the USACOE, which provides for the long-term maintenance of the Project.

7. Enforcement of No Wake Zone.

a. The City commits, to the extent permissible under State law, to establish and maintain a no wake zone in those portions of the Packery Channel that traverse the MBCHC.

b. The City will establish and maintain a marina/parks office adjacent to the project, which will be staffed with Marina marshals, or other appropriate City staff. The Marina marshal, or other appropriate City staff, will be empowered and directed to enforce the no wake zone, as part of their duties. Any enforcement of the no wake zone by the City is in addition to any enforcement by game wardens from TPWD, who have previously agreed to enforce the no wake zone.

8. MOU incorporated into lease between the State and the City. This MOU shall be incorporated into and specifically made a part of and a condition of the lease between the State and the City for that state-owned land to be included in the project under CL20020005.

9. Laws of Texas Applicable. The interpretation and performance of this MOU shall be under and controlled by the laws of the State of Texas.

10. Venue. The sole and exclusive forum for the initial determination of any question of law or fact to be determined in any judicial proceeding relating to this MOU shall be any court of competent jurisdiction in Travis County, State of Texas.

11. Entire MOU. This MOU constitutes the entire agreement between the parties to this MOU with respect to the subject matter of this MOU. The provisions of this MOU are in addition to and not in lieu of any of the provisions of Coastal Lease CL20020005 between the City and the State.

12. Waiver. No delay in exercising or the failure to exercise any right or remedy accruing to or in favor of any party under this MOU impairs any right or remedy or constitutes a waiver of the right or remedy. Every right and remedy given under this MOU or by law may be exercised from time to time and as often as may be deemed expedient by the parties to this MOU.

13. Amendments and Modifications. This MOU may not be amended or modified except in writing. To be effective, any amendment or modification must be signed by and on behalf of both parties by their duly authorized officers.

14. Notices. All written notices, reports, and other documents required or permitted under this MOU must be in writing and are deemed to have been given when delivered personally or deposited in the mails, postage prepaid, registered or certified mail, return receipt requested, or by commercial overnight courier addressed to the party to whom notice is being given at the party's address set forth below. Either party may change its address, and/or the party representative to be notified, by sending written notice that complies with this Section.

TGLO: Asset Inspection Division
 Texas General Land Office
 P.O. Box 12873
 Austin, Texas 78711-2873

City: City Manager
 City of Corpus Christi
 1201 Leopard Street
 P.O. Box 9277
 Corpus Christi, Texas 78469-9277

15. Further Actions. Each party agrees that it will, at its own expense, execute any and all certificates, documents, and other instruments, and take other actions as may be reasonably necessary to give effect to the terms of this MOU.

16. Duplicate Originals. This MOU may be executed in duplicate originals, any one of which is considered to be the original MOU for all purposes.

17. Severability. In the event that any of the provisions, portions, or applications of this MOU are held to be unenforceable or invalid by any court of competent jurisdiction, the City and the State shall negotiate an equitable adjustment in the provisions of this MOU with a view toward effecting the purpose of this MOU, and the validity and enforceability of the remaining provisions, portions, or applications of this MOU are not be affected by the defect in the provision, portion, or application of the MOU that was ruled unenforceable or invalid.

18. Rights of Third Parties. Nothing in this MOU is intended to confer any rights in any person other than the parties to this MOU; nor is anything in this MOU intended to modify or discharge the obligation or liability of any third person to any party to this MOU or give any third person any right of subrogation or action over or against any party to this MOU.

INTRODUCTION

In a letter from the Mollie Beattie Coastal Habitat Community (MBCHC) Management Team, dated August 22, 2002, the team members requested that baseline data be established to determine the extent of any impacts that may occur to the 1,100-acre MBCHC site as a result of the Packery Channel project. The MBCHC is located on Mustang Island just north of Packery Channel encompassing all of State Tracts 59 and 60. The letter went on to further request that a monitoring regime be established to evaluate possible changes after dredging of the Channel is complete.

For the purpose of this scope of work:

- **BASELINE DEFINED (PRE-CONSTRUCTION)** – Used to establish baseline conditions at both the MBCHC and the reference/control site. Baseline to be conducted during the first year, prior to commencement of channel dredging.
- **MONITORING DEFINED (POST CONSTRUCTION / COMPLETION OF DREDGING)** – Upon the completion of channel dredging, monitoring will commence. During years 2 through 5 intensive monitoring will include avian surveys, benthic analyses, field inspections, aerial photographs, and tidal elevation analyses at the MBCHC site. Year 2 is considered to be the first year after channel dredging is complete. **Reference/Control site** to consist of aerial photographs and tide gauge analyses, unless significant changes are observed that warrant field work.

BASELINE: PRE-CONSTRUCTION (MOLLIE BEATTIE & CONTROL)

Appendix A: prepared budget estimate for the requested methodology. The budget is attached for illustrative purposes only and is not adopted by the Texas General Land Office.

Figure 1: summarizes the five-year monitoring program and budget.

- ❖ **DEVELOP PLAN:** Develop a QA/QC plan for both baseline & monitoring efforts. Provide draft copies to the MBCHC Management Team to review and comment.
- ❖ **AERIAL PHOTOGRAPHS:** Depending on time of construction, aerial photographs may be taken twice during the baseline year in order to assess potential indirect impacts to the area. The first aerial will be taken prior to construction during low tide events, near the end of January, and the second aerial taken near the end of July. Every effort will be made to shoot the aerals on low wind, low tide, clear days. The aerals will be taken prior to conducting the initial ground truthing to pinpoint potential areas of concern. The MBCHC Management Team will be notified prior to conducting flyovers. The City of Corpus Christi will be provided copies of each

EXHIBIT D -2

aerial after they are taken. The City will then provide copies to the Management Team shortly thereafter.

- **SPECIFICATIONS:** The photography will include all of State Tracts 59 and 60. The photographs will be in a 9" by 9" true color contact prints and color film diapositives at a scale of 1:4800. The color diapositives will be scanned to a 1-foot pixel resolution, georeferenced, and the imagery will be provided to the MBCHC Management Team. As recommended by the MBCHC Management Team, there will be a spatial accuracy of less than 3 meters, and a thematic accuracy of 85% or better shown on the digitized aerials. Further details to be outlined in the QA/QC Plan.
- **SURVEY WORK:** A survey team will set markers at both sites to aid in rectifying the photographs prior to conducting the aerial flyover. The more points collected in regard to habitat type, the better the data will be to overlay onto the aerials.
- **GROUND TRUTHING:** Ground truthing will take place immediately after the aerial photograph is developed and reviewed (weather permitting).
 - ◆ **TRANSECTS:** Biologists and Surveyors to conduct two transects across the MBCHC (See Fig. 2 for proposed transect lines) to cover all habitat types present only after the first aerial is flown. Will be conducted based on a change in the habitat versus based on a pre-selected spacing interval.
 - ◆ **CHANGE IN HABITAT:** Change in habitat will be observed and documented along the transect lines. Other features will be identified to aid in the interpretation of future aerial photographs. Will focus on unique features and or varying habitat types.
 - ◆ **ELEVATIONS:** Elevations will be taken along the transect lines wherever there is a change in habitat, as well as at some pre-selected target sites where there might be a potential to see a shift in the topography.

All information will be available as digital layers upon request. This information will be available on the aerials via digitization. Digital overlays will be used to indicate changes in shoreline, habitat, seagrasses, etc.

❖ **FIELD WORK:** Field work to be performed at the MBCHC site only.

- **AVIAN POPULATIONS/HABITAT:** Avian surveys will be conducted twice per month over a five month period from November to March. Shore birds will be identified to species, and counted early morning. The avian surveys will be conducted along the emergent shorelines for the Packery Channel and Newport Pass tidal complex, and specifically including the benthic study area.

- **PRESENCE/ABSENCE SEAGRASSES:** Seagrasses can be verified with the aerial photographs, but should there be uncertainty a site visit will be required to verify presence or absence. They can be observed during the bird surveys.
- **BENTHIC COMMUNITIES:** The benthic communities will be sampled once per month during the same five month period as the avian survey (November to March). Shorebirds will be identified to species at the time of benthic sampling along the specific transects. The methodology for collecting benthic samples includes walking two transects (pre-selected), collecting five core samples at various levels of inundation, and sending the samples to a lab for processing. The suggested method of collection is with a 2-inch PVC boring core with a recommended diameter of 5.4 cm. The recommended depth within the sediment for pulling core samples is approximately 5 cm.

Benthic analyses will consist of identifying invertebrates to Family, identifying insect larvae to Order, and determining species diversity, abundance and biomass.

- ❖ **TIDE GAUGE ELEVATIONS:** Tide elevations will be retrieved from the Packery Channel tide gauge information via internet. These elevations selected will be those taken directly off the Packery Channel internet site at the same time the benthic community samples were being collected.

In addition, while on-site for the avian/benthic monitoring, two measurements will be taken within the benthic study area. One measurement taken from the first stake of the benthic study area boundary to the waters edge, and the second measurement is to be taken from the furthest stake to the waters edge. The stakes used on either end of the previously used benthic study area will be used to create a polygon of available surface area. This information in conjunction with the tide gauge elevation information will relate "available surface area" to tide elevations. This "available surface area" is a rough estimate, and will be used to tie the presence of shorebirds to available benthos.

- ❖ **ANNUAL REPORT:** An annual summary report will be submitted to the City of Corpus Christi, and the City will in turn provide copies of the documents to the MBCHC Management Team.

MONITORING: POST CONSTRUCTION: A monitoring survey year will be from September to August.

- ❖ **AERIAL PHOTOGRAPHS:** Aerial photographs will be taken twice during each monitoring year in order to assess potential indirect impacts to the area. There will be four mandatory monitoring years, and the potential for one more year should significant changes be observed at the sites. As with the baseline, the first aerial will be taken near the end of January, and the second near the end of July. Every effort will be made to shoot the aerals on low wind, low tide, clear days. There will be no ground truthing during the monitoring years; however, site

visits may be necessary from time to time based off of information gleaned from aerial photograph comparisons. The City of Corpus Christi will be provided copies of each aerial after they are taken. The City will then provide copies to the MBCHC Management Team shortly thereafter.

- **SPECIFICATIONS:** As mentioned earlier, the photography will include all of State Tracts 59 and 60. The photographs will be in a 9" by 9" true color contact prints and color film diapositives at a scale of 1:4800. The color diapositives will be scanned to a 1-foot pixel resolution, georeferenced, and the imagery will be provided to the MBCHC Management Team. As recommended by the MBCHC Management Team, there will be a spatial accuracy of less than 3 meters, and a thematic accuracy of 85% or better shown on the digitized aerials. Further details to be outlined in the QA/QC Plan.
 - **SURVEY WORK:** A survey team will set markers at both sites to aid in rectifying the photographs prior to conducting the aerial flyover. No other survey work is planned at this time; however, significant changes to habitat may warrant more survey work be performed.

❖ **FIELD WORK**

- **AVIAN POPULATIONS/HABITAT:** Avian surveys will be conducted twice per month over a five month period from November to March. Shore birds will be identified to species, and counted early morning. The avian surveys will be conducted along the emergent shorelines for the Packery Channel and Newport Pass tidal complex, and specifically including the benthic study area.
- **PRESENCE / ABSENCE SEAGRASSES:** Seagrasses can be verified with the aerial photographs, but should there be uncertainty, a site visit will be required to verify presence or absence. They can also be observed during the bird surveys.
- **BENTHIC COMMUNITIES:** The benthic communities will be sampled once per month during the same five month period as the avian survey (November to March). Shorebird species will be identified and counted at the time of collection. There will be two transects (pre-selected) and five core samples collected from various levels of inundation and sent to a lab for processing. The recommended diameter of the boring core is 5.4 cm. The recommended depth within the sediment for pulling core samples is approximately 5 cm.

Benthic analyses will consist of identifying invertebrates to Family, identifying insect larvae to Order, and determining species diversity, abundance and biomass.

- ❖ **TIDE GAUGE ELEVATIONS:** Tide elevations will be retrieved from the Packery Channel tide gauge information via internet. These elevations selected will be those taken directly off the Packery Channel internet site at the same time the benthic community samples were being collected.

In addition, while on-site for the avian/benthic monitoring, two measurements will be taken within the benthic study area. One measurement taken from the first stake of the benthic study area boundary to the waters edge and the second measurement is to be taken from the furthest stake to the waters edge. The stakes used on either end of the previously used benthic study area will be used to create a polygon of available surface area. This information in conjunction with the tide gauge elevation information will relate "available surface area" to tide elevations. This "available surface area" is a rough estimate, and will be used to tie the presence of shorebirds to available benthos.

- ❖ **ANNUAL REPORT:** An annual report will be submitted to the City of Corpus Christi, and the City will in turn provide copies of the documents to the MBCHC Management Team. The post-construction monitoring reports (annual reports) will include change analyses based on pre-construction (baseline) data.

SERVICES NOT INCLUDED

Based upon the MBCHC letter, the monitoring efforts do not include any chemical analyses of sediments or plants, or any water quality analyses. Furthermore, detailed monitoring for the reference/control site is also not included.

REFERENCE/CONTROL SITE

While there is no requirement in the letter from the General Land Office to select a reference site/control similar to the Molly Beattie area and monitor in conjunction with the project site, it is highly recommended if such a site can be found. Should weather anomalies occur and impact the project site, it will be beneficial to show how the reference site/control was affected by the same weather anomalies. The reference/control site should also show whether potential negative occurrences at the Mollie Beattie Coastal Habit Community are the result of Packery Channel project or naturally occurring changes.

While attempts have been made to find a more suitable site, one has not been presented. Any data from the City-provided referenced site may be used only if acceptable to the TGLO, in its sole discretion. In determining whether the data or the reference site is acceptable to the TGLO, the TGLO may consider proximity of the reference sit to the MBCHC or the Project, the hydrological and

geophysical characteristics of the reference site, environmental similarities of the two sites, and/or any other factor that the TGLO considers appropriate.

MONITORING BUDGET
MOLLY BEATTIE COASTAL HABITAT COMMUNITY

I. MONITORING AT MBCHC (Target Site)

B. First Year Monitoring (Baseline): \$87,504.00.

Surveyors (2):

Set marker system/transects/elevations.....\$7,200.00

Biologists (2):

QA/QC Monitoring plan/Development

Bird monitoring – 10 days for the year during the months from
November to March (includes seagrass survey and collecting
benthos during winter season)

Ground truthing

Tide gauge monitoring

Collecting benthos (spring).....\$25,600.00

Lab:

*Benthos analyses.....\$35,604.00

Technical:

Aerial photos - Two state tracts (semi-annually)

GIS time (each season)

Digital overlays to show changes (each season).....\$6,600.00

Office: Annual reporting

Report development– 7 days.....\$5,600.00

Professional report development – ~2 days.....\$2,800.00

Reproduction.....\$500.00

**Meetings/any agency coordination (up to 12 hrs).....\$1,600.00

QA/QC.....\$1,000.00

Project Management.....\$1,000.00

Subtotal for first year baseline.....\$87,504.00

***Estimate based off non-contractual agreement with Mr. Paul Montagna.**

Transects only conducted during first season. Should conditions warrant more survey work/ground truthing, and the City requests it, then additional costs will be incurred. An additional \$2000.00 per day for survey work, and \$1600.00 per day for a biologist to verify significant changes.

A. Years 2 through 5: (Inflation costs ~ 5% increase per year).

Surveyors: No survey work, other than placing markers in the field for aerial photography, is included in years 2-5 budget. Should conditions warrant more survey work/ground truthing, and it is requested, then additional costs will be incurred. An additional \$2000.00 per day for survey work, and \$1600.00 per day for the biologists to verify significant changes.

Setting markers twice a year for aerial photographs....\$3600.00/yr

Biologists:

Verifying marker locations

Bird survey (10 days for the year during the months from November to March)

Benthos Collecting

Tide Gauge Monitoring (internet).....\$22,000.00/yr

Lab:

*Benthos analyses.....\$35,604.00/yr

Technical:

Aerial photos - Two state tracts (semi-annually)

GIS time(semi-annually)

Digital overlays to show changes (semi-annually).....\$6,600.00/yr

Office:

Report development (5 days).....\$4,000.00/yr

Professional report development - 2 days.....\$1,200.00/yr

Reproduction.....\$500.00/yr

*Meetings/Agency coordination/etc.(up to 12 hrs).....\$1,600.00/yr

QA/QC.....\$1,000.00/yr

Project Management.....\$1,000.00/yr

Subtotal for Years 2 through 5.....\$77,104.00/yr

***Estimate based off non-contractual agreement with Mr. Paul Montagna.**

Should transects or additional site visits be requested in subsequent years, additional costs will be incurred.

Subtotal for Monitoring the MBCHC (5% annual inflationary costs):

Year 1 Baseline.....\$87,504.00

Years 2 through 5.....\$348,945.00

Total.....\$436,449.00

Highlighted areas:

The information regarding the cost of the benthic study is still pending as is the cost for aerial photographs.

*Any additional meetings or agency coordination time not included in this budget will be billed accordingly to the City on a time and materials basis in accordance with our most recent standard rates and schedules.

II. MONITORING AT CORPUS CHRISTI PASS (Reference/Control Site)

B. First Year Monitoring (Baseline): \$23,500.00

Surveyors (2):

Set marker system/two transects/elevation.....\$6,000.00

Biologist:

Ground truth.....\$4,000.00

Interpret aerials.....\$1,000.00

Technical:

Aerial photos - Two state tracts (semi-annually)

CAD time (each season)

Digital overlays to show changes (each season).....\$6,600.00

Office:

Letter report development (3 days).....\$2,400.00

Professional report development (1 days).....\$1,000.00

Reproduction.....\$500.00

QA/QC.....\$1,000.00

Project Management.....\$1,000.00

Year 1 Subtotal.....\$23,500.00

C. SUBSEQUENT YEARS:

Years 2 through 5:

No monitoring occurs at the reference/control site. No survey work takes place at this site unless significant changes are observed via aerial photographs.

Surveyors: Set markers.....\$3,000.00/yr

Biologist: Interpret aerials

Analyze Tide gauges.....\$3,600.00/yr

Technical: Aerial photos - Two state tracts (semi-annually)

GIS time (each season)

Overlays to show changes.....\$6,600.00/yr

Office:

Letter report development (2 days).....\$1,600.00/yr

Professional report development (1 days).....\$800.00/yr

Reproduction.....\$500.00/yr

QA/QC.....\$1,000.00/yr

Project Management.....\$1,000.00/yr

Subtotal.....\$18,100.00/yr

Year 1 Baseline.....\$23,500.00

Years 2 through 5.....\$81,914.00

Total Reference site cost with the 5% inflationary cost.....\$105,414.00

Total MBCHC target site cost with the 5% inflationary cost.....\$436,449.00

Total estimated costs for the MBCHC and the Reference / Control Site

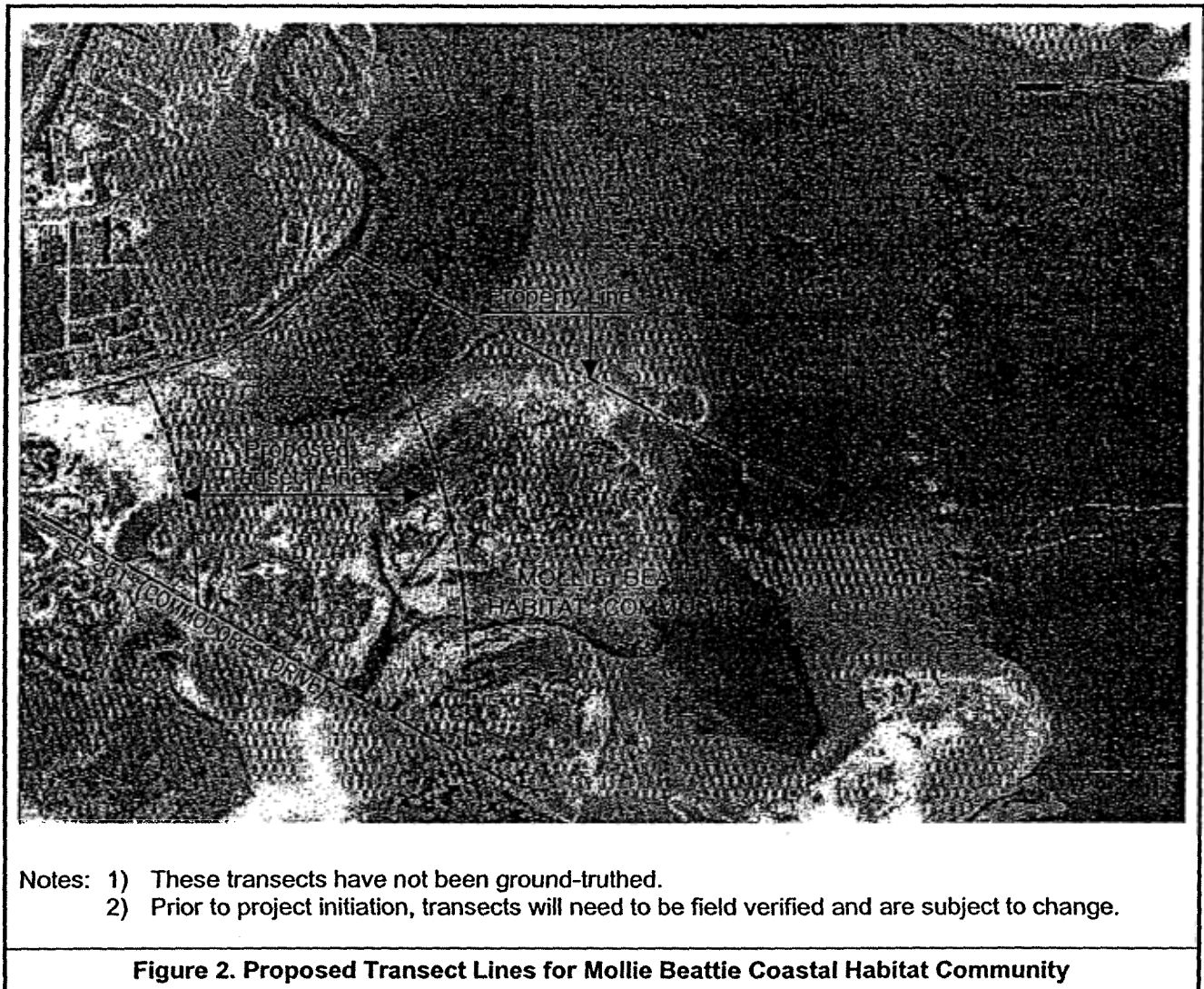
(with the 5% annual charge for inflationary purposes).....\$541,863.00

Highlighted areas: costs are still being verified.

Figure 1. Monitoring Program Overview

MONITORING PROGRAM OVERVIEW ¹					
	Year 1	Year 2	Year 3	Year 4	Year 5
Objective	<i>establish baseline at Mollie Beattie/ Aerial review of control site</i>	<i>Detailed Monitoring of Mollie Beattie / Aerial review of control site</i>	<i>Detailed monitoring of Mollie Beattie / Aerial review of control site</i>	<i>Detailed monitoring of Mollie Beattie / Aerial review of control site</i>	<i>Detailed monitoring of Mollie Beattie / Aerial review of control site</i>
Major Activities	<u>Mollie Beattie (Detailed)</u> <ul style="list-style-type: none"> ▪ Set baseline and transect elevation ▪ Ground truth along baseline (once) ▪ Aerial photos (2/year) ▪ Bird survey (2/month – 5 months) ▪ Benthic samples and analyses ▪ Analyze tide gauge data ▪ QA / QC ▪ Report ▪ Agency coordination 	<u>Mollie Beattie</u> <ul style="list-style-type: none"> ▪ Aerial photos (2/year) ▪ Bird Survey (2/month – 5 months) ▪ Benthic samples and analyses ▪ Analyze tide gauge data ▪ QA/QC ▪ Report ▪ Agency Coordination 	<u>Mollie Beattie</u> <ul style="list-style-type: none"> ▪ Aerial photos (2/year) ▪ Bird survey (2/month – 5 months) ▪ Benthic samples and analyses ▪ Analyze tide gauge data ▪ QA / QC ▪ Report ▪ Agency Coordination 	<u>Mollie Beattie</u> <ul style="list-style-type: none"> ▪ Aerial photos (2/year) ▪ Bird survey (2/month – 5 months) ▪ Benthic samples and analyses ▪ Analyze tide gauge data ▪ QA/QC ▪ Report ▪ Agency Coordination 	<u>Mollie Beattie</u> <ul style="list-style-type: none"> ▪ Aerial photos (2/year) ▪ Bird survey (2/month – 5 months) ▪ Benthic samples and analyses (2/year) ▪ Analyze tide gauge data ▪ QA / QC ▪ Report ▪ Agency Coordination
Annual Budget \$/Yr (with 5%/yr inflation)	Mollie Beattie.....\$87,504 Reference site.....23,500 <u>Total.....\$111,004</u>	Mollie Beattie.. \$80,960 Reference site.. 19,005 <u>Total \$99,965</u>	Mollie Beattie.....\$85,007 Reference site.....19,955 <u>Total.....\$104,962</u>	Mollie Beattie ..\$89,258 Reference site...20,953 <u>Total.....\$110,211</u>	Mollie Beattie.....\$93,720 Reference site.....22,001 <u>Total.....\$115,721</u>
Cumulative	\$111,004	\$210,969	\$315,931	\$426,142	\$541,863

¹ See Recommended Scope of Work and estimated budget dated 10/11/02 for details and assumptions.



North Padre Island Storm Damage Reduction and Environmental Restoration Project Mitigation Plan

- I. To mitigate for the subject project, the City of Corpus Christi (city) will construct or cause to be constructed breakwater(s) that will assist in protecting Shamrock Island and will create or cause to be created a approximately 15.6 acres of submerged aquatic vegetation (SAV). Construction of the breakwater(s) must be concurrent with the construction of Packery Channel.
- II. The City shall be responsible to the Texas General Land Office and the School Land Board for successful completion of all of the requirements of this Mitigation Plan.
- III. The city will partner with and work through the Coastal Bend Bays and Estuaries Program (CBBEP) to perform the required mitigation. The city will deposit \$1,250,000 with the CBBEP to fund the required mitigation. As a condition of the transfer of funds to the CBBEP, the city will secure the written commitment of the CBBEP to be bound to all the terms, conditions, and requirements of this Mitigation Plan. This funding will be for the exclusive use of protecting and enhancing Shamrock Island, including the creation of 15.6 acres of SAV. Once the project is determined by the GLO to be successful, any remaining funds will be used to further enhance Shamrock Island and adjacent submerged state owned land.

The City will require that wherever possible, the CBBEP will seek matching or other funds to further protect or enhance the Island.

- IV. A team consisting of the Nature Conservancy, CBBEP, GLO, and applicable state and federal resource agencies (team) will provide input into the project. All recommendations of the team will be a consensus of the team, and must be approved by the GLO and Nature Conservancy as landowners. Working with this team, the CBBEP will undertake appropriate studies to determine the correct pattern of work to be undertaken. Areas of work to be considered will include, but not be limited to, protection of the North end of the Island, protection of the South end of the Island, re-nourishment of the feeder beach, and possible repair and/or upgrade of the existing geotube. One requirement for successful completion of the project will be the creation of 15.6 acres of SAV.
- V. The entire \$1,250,000 will be held and utilized solely for the protection and enhancement of Shamrock Island and adjacent state owned submerged land. The CBBEP will undertake those actions recommended by the team after review of the studies to protect and enhance Shamrock Island. In no event will the cost of project management, alternatives analysis, engineering and design, permitting, and construction oversight exceed 20% of the funds deposited.

- VI. The CBBEP with the consensus of the team and with the approval of the GLO and the Nature Conservancy will determine specific locations of the breakwater(s), type of breakwater(s), and habitat creation.

If the breakwater(s) is/are constructed of rock, the footprint of the breakwater(s) will be considered habitat creation, provided the GLO and Nature Conservancy approve the configuration.

- VII. The created SAV habitat will be allowed to naturally vegetate for 2 full growing seasons after the breakwater is constructed. If after three years, 50% of the required SAV mitigation has naturally vegetated, the CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 50% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

If after five years, 70% coverage of the required SAV mitigation has not been achieved; CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 70% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

It is understood and agreed by all parties that the city's financial contribution shall be limited to \$1,250,000 and the CBBEP's actions to plant seagrass, if required, shall come from this amount.

- VIII. The CBBEP, on behalf of the city, will submit annual reports beginning in year 3 to the GLO indicating the percent coverage and acreage of SAV, and acreage and habitat of Shamrock Island.

- IX. The project will be determined to be a success when the breakwater(s) has/have been installed, approximately 15.6 acres of SAV has been created, and no significant amount of habitat (excluding open water fish habitat) has been lost on Shamrock Island. There may be some changes in habitat type on Shamrock Island resulting from reduction of wave energy reaching the island, and this will not cause the project to be deemed unsuccessful.

September 5, 2002

TRACT 6

STATE OF TEXAS
COUNTY OF NUECES

FIELDNOTES FOR 30.713 ACRE TRACT OF STATE OWNED SUBMERGED LANDS OUT OF LAGUNA MADRE STATE TRACT 61;

Bearings and coordinates are surface, based on the Texas State Plane Coordinate System, South Zone (4205), North American Datum of 1983 and referenced to National Geodetic Survey Monuments, SP 020 and SQ 020. The mean higher high water shoreline, as cited herein was located on a contour elevation of 0.4 feet, North American Vertical Datum of 1988, utilizing datum derived from Tide Gauge Station "Packery Channel".

BEGINNING at a point (Coordinates - N 17,120,761.92 feet, E 1,395,382.21 feet) on the northeast right-of-way line of Park Road No. 22 (South Padre Island Drive), for the west corner of this tract, from which point, the intersection of said northeast right-of-way line of Park Road No. 22 and the southeast right-of-way line of the Gulf Intracoastal Water Way bears North 64° 44' 38" West, a distance of 1045.87 varas (2905.19 feet);

THENCE, North 25° 15' 22" East, a distance of 324.50 varas (901.38 feet), to a point, for the north corner of this tract;

THENCE, South 64° 44' 38" East, a distance of 560.64 varas (1557.34 feet), to a point, for the east corner of this tract, same point being on a curve to the left, which curve has a central angle of 05° 38' 59", a radius of 1856.35 varas (5156.52 feet), a tangent distance of 91.60 varas (254.44 feet), an arc length of 183.05 varas (508.47 feet) and whose radius point bears South 53° 53' 19" East, a distance of 1856.35 varas (5156.52 feet);

THENCE, in a southwesterly direction with said curve to the left, an arc distance of 183.05 varas (508.47 feet), to a point, for a corner of this tract;

THENCE, South 30° 27' 42" West, a distance of 63.35 varas (175.97 feet), to a point, for the most easterly south corner of this tract, same point being the point of curvature of a circular curve to the right, which curve has a central angle of 84° 47' 40", a radius of 88.23 varas (245.09 feet), a tangent length of 80.56 varas (223.77 feet) and an arc length of 130.58 varas (362.72 feet);

THENCE, with said curve to the right, an arc distance of 130.58 varas (362.72 feet), to a point, on aforementioned northeast right-of-way line of Park Road No. 22, for the most westerly south corner of this tract;

EXHIBIT F

September 5, 2002

THENCE, North 64° 44' 38" West, with said northeast right-of-way line of Park Road No. 22, a distance of 441.47 varas (1226.30 feet) to the **Point of Beginning** and containing 30.713 acres (1,337,877.53 square feet) of land.

Pyle & Associates, Inc.

George M. Pyle 9-05-02

George M. Pyle

R.P.L.S. No. 1258, L.S.L.S.

TRACT 61
LAGUNA MADRE SUBMERGED LAND TRACTS
(STATE OF TEXAS)

FILE & ASSOCIATES, INC.

SOUTHEAST RIGHT-OF-WAY LINE OF
THE GULF INTRACOASTAL WATER WAY

WATER

TRACT 1

S 64°44'38" E 560.64v (1557.34')

RADIUS POINT BEARS
S 53°53'19" E
1856.35v (5156.52')

WATER

TRACT 6
1,337,877.53 sq. ft.
30.713 acres

POINT OF
BEGINNING

N 64°44'38" W
1045.87v
(2905.19')

N 25°15'22" E 324.50v (901.38')

N 64°44'38" W 441.47v (1226.30')

N 17120761.92
E 1395382.21

525'

TRACT 1

WATER

S 30°27'42" W
63.35v (175.97')

Δ=84°47'40"
R=88.23v (245.09')
T=80.56v (223.77')
L=130.58v (362.72')

€ PARK ROAD NO. 22

(SOUTH PADRE ISLAND DR.)

(TEXAS DEPARTMENT OF TRANSPORTATION)

MEAN HIGHER HIGH WATER LINE
LOCATED ON CONTOUR ELEVATION
0.4 FEET (NAVD 88) UTILIZING
DATUM DERIVED FROM TIDE GAUGE
STATION "PACKERY CHANNEL"

I, George M. Pyle, LICENSED STATE LAND SURVEYOR,
do hereby certify that the foregoing shoreline and
boundary survey was made by me on the ground
and that the limits, boundaries and corners,
natural and artificial are as described hereon.

George M. Pyle 9-05-02
George M. Pyle, L.P.L.S. #1258 L.S.

BEARINGS AND COORDINATES ARE SURFACE, BASED ON
TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE
(4205), NAD 83, AND REFERENCED TO NATIONAL GEODETIC
SURVEY MONUMENTS, SP 020 AND SQ 020.

200 100 0 200 400
SCALE IN FEET

P PYLE & ASSOCIATES, INC.
PROFESSIONAL LAND SURVEYORS
5262 SOUTH STAPLES, SUITE 350-A
CORPUS CHRISTI, TX. 78411
PHONE: (361) 993-4191
FAX: (361) 985-0967

JOB. #2027 001 05

MAP TO ACCOMPANY
METES AND BOUNDS DESCRIPTION
OF
A 30.713 ACRE TRACT OF STATE OWNED
SUBMERGED LANDS OUT OF THE LAGUNA
MADRE STATE TRACT 61.



August 23, 2002

Ms. Carolyn Murphy, Chief
Environmental Section
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

RE: North Padre Island Storm Damage Reduction and Environmental
Restoration Project (Packery Channel)
City of Corpus Christi Project No. 5122
Packery Channel MMPA – Dredge Site Alignments

Dear Ms. Murphy:

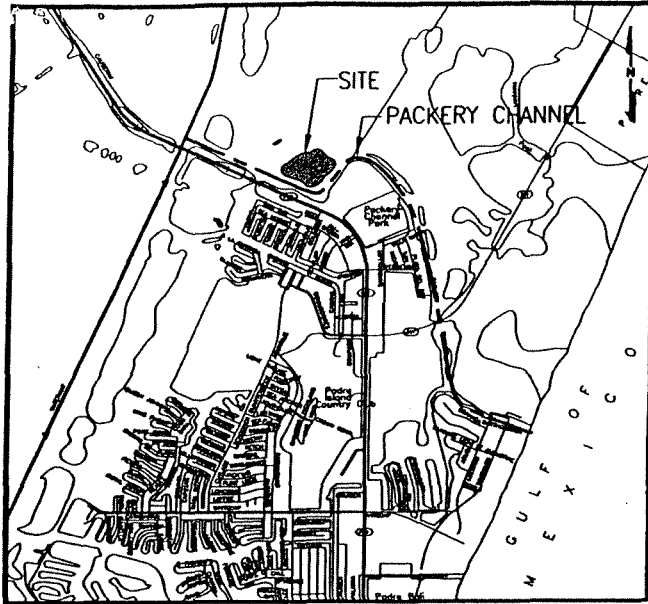
Forwarded is the layout for the MMPA. The disposal limits were outlined on the PBS & J photo/drawing that you provided. This PA will be made up of the two cells encompassing a total of approximately 10.0 acres of upland, high-salt marsh and mud flats. To accommodate the maintenance material, the perimeter dike will be built with a top elevation of 20 feet from the ground elevation, maintaining a 4-foot top width and 3 to 1 slopes. This site will accommodate anticipated maintenance dredging of 15,000 CY of material every 5 years for the 50-year project life, for a total capacity of 150,000 CY. Two (2) 30-foot wide construction access corridors are included for equipment access from Packery Channel.

Sincerely,

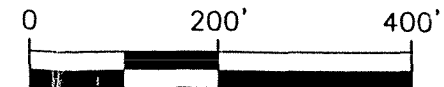
Angel R. Escobar, P.E.
Director of Engineering Services

ARE:rr
Encls.

cc: Col. Leonard d. Waterworth, Corps of Engineers
Carl M. Anderson, P.E., Corps of Engineers
Herbie Maurer, Corps of Engineers
Manuel Freytes, GLO Regional Director



VICINITY MAP
N.T.S.



CITY of CORPUS CHRISTI
TEXAS
Department of Engineering Services

PROPOSED
PACKERY CHANNEL

MMPA

SHEET 1 of 1
RECORD DRAWING NO.

CITY PROJECT #



City of
Corpus
Christi

August 1, 2002

Carolyn Murphy, Chief
Environmental Section
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

RE: North Padre Island Storm Damage Reduction and Environmental
Restoration Project (Packery Channel)
City of Corpus Christi Project No. 5122
Port of Harlingen Authority/
Permit for Deposit of Dredged Material

Dear Ms. Murphy:

Enclosed is the 50-year permit for disposal of dredged material site for Packery Channel for area known as the emergent island east of GIWW Dredge Material Placement Area No. 174.

Sincerely,

Ángel R. Escobar, P.E.
Director of Engineering Services

ARE:rr
Encls.

PORT OF HARLINGEN AUTHORITY
PERMIT FOR DEPOSIT OF DREDGED MATERIAL

THIS AGREEMENT, by and between the Port of Harlingen Authority of Cameron County, Texas, a political subdivision of the State of Texas, with offices four miles east on FM 106, Harlingen, Texas 78550 ("Authority") and the City of Corpus Christi, Nueces County, Texas, a Texas municipal corporation, with offices at 1201 Leopard Street, Corpus Christi, Texas 78401 ("City").

1. The City has requested Authority to allow it to use the dredged material placement facility known as the emergent island east of GIWW Dredge Material Placement Area No. 174, which is located in Nueces County, Texas, and which is located within the easement obtained by the Authority for the construction of the Gulf Intracoastal Waterway south of Corpus Christi Bay, for deposit of maintenance dredged material taken from Packery Channel reach number 2. The City has advised Authority that approximately 150,000 cubic yards of dredged material will be deposited on the emergent island east of GIWW Dredge Material Placement Area No. 174 over the fifty-year maintenance term.
2. Authority grants to City permission to deposit dredged material on the emergent island east of GIWW Dredge Material Placement Area No. 174.
3. The emergent island east of GIWW Dredge Material Placement Area No. 174 is provided to City "As Is, Where Is" and City shall, by whatever method it alone chooses, determine the condition of the emergent island east of GIWW Dredge Material Placement Area No. 174 and related levees and spillways, and shall make such repair or modifications of the same as are necessary to accommodate the material and effluent from City's dredging. The Authority makes no warranty, expressed or implied, that the emergent island east of GIWW Dredge Material Placement Area No. 174 is in condition to receive or accept the material to be deposited by City.
4. TO THE EXTENT AUTHORIZED BY LAW, THE CITY ASSUMES FULL RESPONSIBILITY TO AUTHORITY AND THE UNITED STATES OF AMERICA FOR THE PROPER PERFORMANCE OF THE DREDGING OPERATION CONDUCTED BY CITY AND ITS DREDGING CONTRACTOR AND FOR DEPOSIT OF DREDGED MATERIAL BY CITY'S DREDGING CONTRACTOR ON THE EMERGENT ISLAND EAST OF GIWW DREDGE MATERIAL PLACEMENT AREA NO. 174 UNDER THE PROVISIONS OF THIS AGREEMENT. CITY AND ITS DREDGING CONTRACTOR SHALL CONFORM TO THE DIRECTIONS OF THE DIRECTOR OF ENGINEERING SERVICES FOR AUTHORITY, THE U.S. ARMY CORPS OF ENGINEERS, AND TEXAS DEPARTMENT OF TRANSPORTATION, IF ANY ARE GIVEN, IN ALL MATTERS RELATING TO THE DEPOSIT OF DREDGED MATERIAL ON THE EMERGENT ISLAND EAST OF GIWW DREDGE MATERIAL PLACEMENT AREA NO. 174, AND THE PROPER USE, CONSTRUCTION AND MAINTENANCE OF LEVEES, DIKES, OR DRAINS WHICH ARE NECESSARY IN CONNECTION WITH THIS WORK.

CITY FURTHER AGREES TO DEFEND, INDEMNIFY, AND HOLD THE AUTHORITY HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS, DEMANDS, CAUSES OF ACTION, AND LIABILITIES OF ANY NATURE (INCLUDING COURT COSTS AND FEES AND EXPENSES OF ATTORNEYS, ENGINEERS, AND OTHER CONSULTANTS INCIDENT TO INVESTIGATION AND DEFENSE) THAT MAY ARISE BY VIRTUE OF THE DEPOSIT OF DREDGED MATERIAL UNDER THIS AGREEMENT OR THE EXERCISE BY CITY OF ANY OTHER PRIVILEGES ACCORDED BY THIS AGREEMENT. CITY WARRANTS THAT THE MATERIAL TO BE DREDGED AND PLACED IN THE AUTHORITY'S DREDGE MATERIAL PLACEMENT AREA MEETS THE TIER 1 PROTECTIVE CONCENTRATION LEVELS FOR CHEMICALS OF CONCERN AS DESCRIBED IN 30 TEXAS ADMINISTRATIVE CODE (TAC), CHAPTER 350.75 AND 350.77. THE CITY AGREES THAT IF PLACEMENT OF DREDGED MATERIALS REQUIRES A RESPONSE OR CORRECTIVE ACTION UNDER 30 TAC CHAPTER 350 OR ANY OTHER APPLICABLE RULES, THAT THE CITY WILL BEAR THE FULL COSTS FOR THE RESPONSE OR CORRECTIVE ACTION.

5. This permit is issued subject to the rights of Authority, and subject to any rights previously granted by Authority to the United States of America and Texas Department of Transportation.

6. Any controversy or claim arising out of or relating to this permit, or the breach thereof, will be settled by arbitration in Corpus Christi, Texas, in accordance with the Commercial Arbitration Rules of the American Arbitration Association, and judgment on the award rendered by the arbitrator(s) may be entered in any district court in Cameron County, Texas.

7. This permit shall become effective upon the date of its execution for a period not to exceed fifty years from the date the initial dredging of Packery Channel for the North Padre Island Storm Damage Reduction and Environmental Restoration project is completed. No dredging work may be performed until this agreement has been executed by both the Authority and the City.

EXECUTED in duplicate by the City on this 1st day of August, 2002.

CITY OF CORPUS CHRISTI

P. O. Box 9277

Corpus Christi, Texas 78469

Telephone: (361) 880-3500

Facsimile: (361) 880-3501

ATTEST:

By:

Armando Chapa
ARMANDO CHAPA,
City Secretary

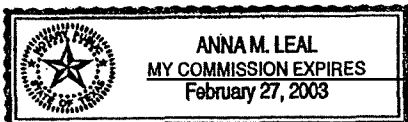
By:

David R. Garcia
DAVID R. GARCIA
City Manager

THE STATE OF TEXAS §

COUNTY OF NUECES §

This instrument was acknowledged before me on the 1 day of August, 2002, by DAVID R. GARCIA, City Manager for the CITY OF CORPUS CHRISTI, a Texas municipal corporation, on behalf of said corporation.



Anna M. Leal
NOTARY PUBLIC, STATE OF TEXAS

APPROVED AS TO FORM: This 1st day of August, 2002.

JAMES R. BRAY, JR
City Attorney

By:

Hayle Curtis
R. JAY REINING
First Assistant City Attorney

(for
ENIOR

EXECUTED in duplicate by the Authority on this ____ day of August, 2002.

PORT OF HARLINGEN AUTHORITY

P.O. Box 2646

Harlingen, Texas 78551

Telephone: (956) 423-0283

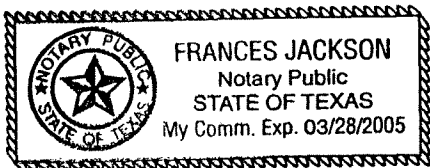
Facsimile: (956) 423-0284

By: *Butch Palmer*
Butch Palmer
Port Director

THE STATE OF TEXAS §
§
COUNTY OF CAMERON §

This instrument was acknowledged before me on the 1st day of August, 2002, by Butch Palmer, Port Director, Port of Harlingen Authority, a political subdivision of the State of Texas, on behalf of the Authority.

Frances Jackson
NOTARY PUBLIC, STATE OF TEXAS





An employee-owned company

5 August 2002

Joe Trejo
City Hall
1201 Leopard St.
Corpus Christi, Texas 78401

PBS&J Job No. 440561.00

Dear Joe,

Carolyn asked me to send you the results of the habitat field investigation at the proposed new MMPA. As you can see, there is not a lot of upland acreage. Add in high salt marsh and there is probably plenty, but that may require mitigation.

Sorry I couldn't get this to you any sooner.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mart'.

Martin E. Arhelger
Vice President

Cc: Carolyn Murphy, USACE
Patsy Turner, PBS&J

Encl.

VEG TYPE	AREA_METER	ACRES	TOTALS
AF	506.815	0.125	0.125
HSM	41969.417	10.371	
HSM	12362.785	3.055	
HSM	54531.046	13.475	26.901
OW	155.828	0.039	0.039
SF	1968.011	0.486	
SF	3793.211	0.937	
SF	903.472	0.223	
SF	2369.448	0.586	2.232
TF	42812.496	10.579	10.579
UPL	3166.276	0.782	
UPL	10190.274	2.518	3.300

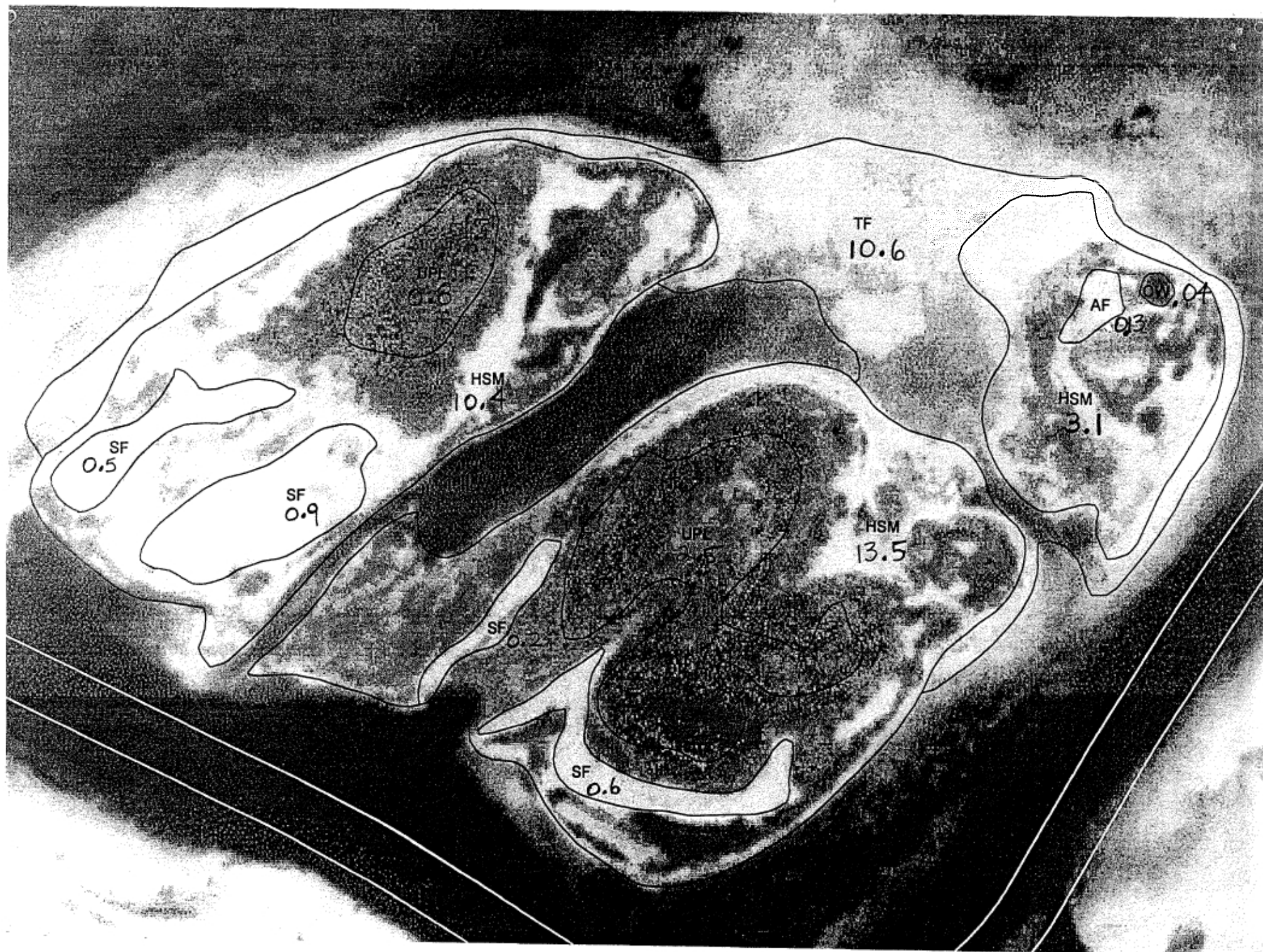




EXHIBIT B-1
City of Corpus Christi
CL20020005

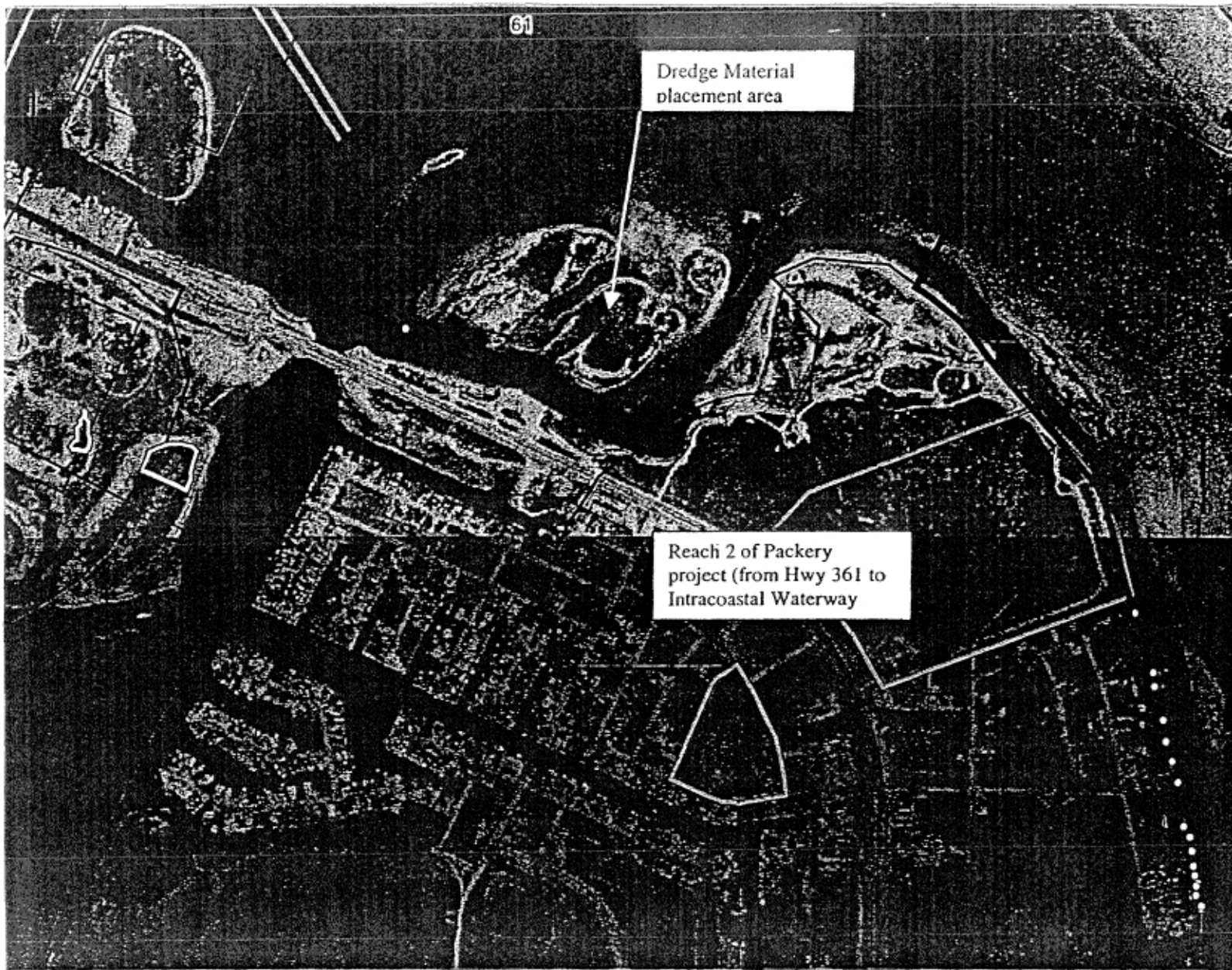


EXHIBIT B-2
City of Corpus Christi
CL20020005

APPENDIX B

TEXAS COASTAL MANAGEMENT PROGRAM (CMP) COMPLIANCE WITH GOALS AND POLICIES

APPENDIX B
TEXAS COASTAL MANAGEMENT PROGRAM (CMP)
COMPLIANCE WITH GOALS AND POLICIES

INTRODUCTION

The Texas Coastal Management Program (CMP) was submitted to NOAA for review pursuant to §306 of the Federal Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 et seq. The Office of Ocean and Coastal Resource Management approved the CMP in 1996. Federal approval of the CMP requires that Federal actions occurring within the CMP boundary be consistent with the goals and policies of the CMP. To show compliance, Federal agencies responsible for these actions must prepare a consistency determination and submit it to the State for review. Details of the Project, as well as environmental impacts, are presented in previous sections of this FEIS and will be referenced in this determination.

IMPACTS ON COASTAL NATURAL RESOURCE AREAS

The CMP's regulatory program focuses on management of 16 areas of particular concern identified as coastal natural resource areas (CNRAs) that are associated with coastal resources considered valuable, vulnerable, or unique. Several of the CNRAs listed in 31 TAC §501.3 are found reasonably close to the areas discussed in this FEIS. Each CNRA near the Project is briefly described, including the associated impacts, below.

Waters of the Open Gulf of Mexico

Waters of this CNRA include all those that are part of the Gulf of Mexico within the territorial limits of the State, including fishery habitat and resources, therein. The eastern terminus of the proposed alignment of Packery Channel will exit into the Gulf of Mexico. This outlet is not expected to result in adverse impacts to waters or fisheries within the open Gulf aside from minor, temporary negative effects from turbidity during the initial channel dredging and subsequent annual maintenance dredging, and placement of the jetty (2.9 acres).

Waters Under Tidal Influence

Waters under tidal influence include those waters mapped by TNRCC as such, including coastal wetlands. According to mapping provided by the Texas Coastal Coordination Council (1996), all waters near the Project are considered to be tidally influenced. Although changes in tidal range of approximately +0.01 foot in Corpus Christi Bay, -0.01 foot in Laguna Madre, and -0.09 foot in Packery Channel at Laguna Madre are estimated, the effects of these changes are expected to be minimal. Only approximately 0.2 acre of open water will be filled during the placement of dredged material at PA 3, and about 49.4 acres of open water underlie the footprint of the channel. The primary impacts to tidally influenced waters and wetlands, such as turbidity, will result from dredging and placement activities during the initial construction phase and during periodic maintenance. However, the release of suspended solids

will be minimized according to requirements of the State §401 Certification. Impacts to coastal wetlands are addressed in Section 6.2.4.

Submerged Lands

Submerged lands are those lands under tidally influenced waters or under waters of the Gulf of Mexico, independent of whether they are State-owned. The length of Reach 2 and the Inner Basin are considered submerged lands. Impacts to these areas will be minimized, since the Project follows an existing channel along this reach.

Coastal Wetlands

The primary impacts to coastal wetlands will be caused by the loss of approximately 11.1 acres of high and low salt marsh. These habitats will be most affected by the proposed channel and placement construction associated with changes to the Inner Basin and the gulfward extension of Packery Channel.

Submerged Aquatic Vegetation

This project is located near areas characterized as having large expanses of seagrasses. Approximately 5.2 acres of SAV within the footprint of the channel and dredged material placement areas may be lost. The alignment was shifted during the conceptual stages of the Project to minimize direct impacts to SAV. Turbidity associated with dredging may temporarily reduce light conditions during high growth seasons. Dredged material placement, however, will be placed in upland sites (confined and partially confined) or on the beaches north and south of the jetties and is not expected to impact SAV.

Tidal Flats (Sand and Mud)

Tidal sand and mud flats are unvegetated (including those with algal mats) intertidal flats that are periodically exposed and flooded by tides. Much of the area north of the SH 361 bridge is considered tidal sand or mud flats and also contain algal mats. Since the existing channel lies adjacent to these CNRAs, impacts to these areas are expected to be minimal. However, within the proposed channel to be dredged approximately 1.5 acres of tidal flats are expected to be negatively impacted. An additional 0.3 acre of tidal flats would be negatively affected by proposed recreational development.

Oyster Reefs

Several significant oyster reefs exist in the Corpus Christi-Nueces Bay System, although they are absent from the Upper Laguna Madre (CCS, 1996). Therefore, adverse impacts to oyster resources are not expected to occur as a result of dredging and dredged material placement operations.

Hard Substrate Reefs

This CNRA includes rocky outcrops and serpulid worm reefs, living and dead, found in intertidal or subtidal areas. There are no naturally occurring hard substrate formations in the vicinity of the

Project. The closest rock outcrop is located just north of the City of Aransas Pass and is crossed by the GIWW. The closest serpulid worm reefs are located farther south in the Laguna Madre and Baffin Bay.

Coastal Barriers

Undeveloped areas on barrier islands, peninsulas, or other protected areas designated by FWS maps are considered coastal barrier resources. One coastal barrier area, Mustang Island (Coastal Barrier Resources System unit #TX-15P, as mapped by FWS), will be impacted by the Project. Mustang Island is located north of the proposed alignment of Packery Channel. TX-15P will be impacted by the placement of dredged material at PA 2, PA 4N, and the MMPA, in addition to the construction of proposed recreational features and amenities. The portion of the Mustang Island coastal barrier resource to be affected by the Project is confined within largely undeveloped wildlife preserve areas and a small portion of a Nueces County beach park. PA 4N will be the site of beach nourishment with sandy material dredged from the construction and up-drift of the jetties.

Coastal Shore Areas

Coastal shore areas are within 100 feet landward of the high water mark on submerged land. These resource areas function as buffers, protecting upland habitats from erosion and storm damage and adjacent marshes and waterways from water quality degradation. This type of CNRA is found landward of Packery Channel along Reach 2 as well as surrounding the Inner Basin. Land along Reach 2 should not be impacted by the Project. Dredged material will be placed on the coastal shore areas adjacent to all lands along Reach 1, including PA 4. Adverse impacts to coastal shore areas are expected to be minimal.

Gulf Beaches

Gulf beaches border the Gulf of Mexico and extend inland from the line of mean low tide to the natural line of vegetation. The area of North Padre Island flanking Packery Channel as it exits into the Gulf, including PA 4N and PA 4S, covers Gulf beaches. Aside from the channel that will be dredged, the Gulf beach underlying PA 4 will be nourished with sand from the construction and up-drift from the jetties. This will help to abate historic erosion along North Padre Island's Gulf beach. Approximately 9.2 acres of beaches will be directly impacted by the dredging of the channel and placement of dredged maintenance material. Approximately 46 acres of beach nourishment is proposed; thus, a temporary impact will occur to the beach area when sand placement occurs. Potential secondary public park improvements may impact 3.7 acres of beach.

Critical Dune Areas

Critical dune areas include those dunes within 1,000 feet of the mean high tide line. The portions of Packery Channel, PA 1, PA 2, and associated recreational facilities that fall within this zone will result in displacement of critical dune areas. However, the utilization of an existing washover minimizes the impacts to dunes from the Project. The City of Corpus Christi (2002a) proposes to relocate approximately 5,670 cy of dunes (approximately 1.5 acres) to a depressional area between PA 2 and Zahn Road landward of the foredune ridge.

Special Hazard Areas

Special hazard areas are areas designated by the administrator of the Federal Insurance Administration under the National Flood Insurance Act as having special flood, mudslide, and/or flood-related erosion hazards. The Project is within special flood hazard areas mapped within 100-year coastal floodplain with velocity and 100-year floodplain (FEMA, 1985). Potential development associated with the opening of Packery Channel will likely occur.

Critical Erosion Areas

These areas are those Gulf and bay shorelines that are undergoing erosion and are designated by the Commissioner of the General Land Office under Texas Natural Resources Code, §33.601(b). The closest critical erosion area is found in Aransas Bay north of the Project area; thus the Project is not expected to affect any designated critical erosion areas.

Coastal Historic Areas

This CNRA consists of sites listed or eligible for listing on the NRHP and SALs. Compliance with the CMP regarding coastal historic areas is accomplished through procedures established by Section 106 of the National Historic Preservation Act of 1965 (NHPA), as amended. These coastal historic sites, as well as non-coastal historic sites, are discussed in Section 3.8 of this FEIS, with impacts discussed in Section 4.8.

Coastal Preserves

This natural resource includes only State-owned lands, including wildlife management areas and parks, that are identified as coastal by TPWD. Three State-owned lands in the general project area include: 1) Mustang Island State Park located within Coastal Barrier Resources unit #TX-15P, north of the Project; 2) Redhead Pond Wildlife Management Area, a small area located on the mainland side of the Laguna Madre south of the JFK Causeway; and 3) MBHC which occurs just north of the existing Packery Channel. Based on their distance from the Project, impacts are not expected to occur from dredging or dredged material placement to Mustang Island and Redhead Pond Wildlife Management Area. MBHC, just to the north of SH 361, is an important wildlife area managed by the GLO with the support of the management team (TPWD, FWS, and the National Audubon Society). MBHC encompasses much of piping plover Critical Habitat unit TX-6. The existing Packery Channel (Reach 2) occurs immediately south of the MBHC. The boundary between MBHC and the existing Packery Channel is not readily discernible; however, the proposed widening and deepening of the existing channel will occur within current limits of the channel. Potential negative impacts to MBHC are associated with the dredging process and will include turbidity in the water and noise from equipment and humans. These direct impacts are considered temporary and, thus, would not result in significant long-term implications. Potential shoreline erosion adjacent to Packery Channel due to increased boat traffic and wakes and hydrologic changes due to reopening the channel to the Gulf are a concern. Secondary impacts may include an increase in public use of MBHC due to the construction of Packery Channel resulting in an increase in vehicle traffic, including watercraft and automobiles.

COMPLIANCE WITH GOALS AND POLICIES

The following goals and policies of the CMP were reviewed for compliance. A summary of actions designed to comply with the specific requirements are presented below.

§501.14(h)	Development in Critical Areas
§501.14(i)	Construction of Waterfront Facilities and Other Structures on Submerged Lands
§501.14(j)	Dredging and Dredged Material Disposal and Placement
§501.14(k)	Construction in the Beach/Dune System
§501.14(m)	Development Within Coastal Barrier Resource System Units and Otherwise Protected Areas on Coastal Barriers
§501.15	Policy for Major Actions

ENVIRONMENTAL BENEFITS

Beach nourishment will provide a positive impact from placing dredged material on the shoreline. This will counter the current erosional trend of the shoreline. Placement of this sandy material will provide some storm protection, add public beach areas, and sustain forage habitat for piping plovers.

CONSISTENCY DETERMINATION

The Project addressed in the DEIS has been reviewed for consistency with the goals and policies of the CMP. CNRAs in the Project area are identified and evaluated for potential impacts from activities associated with the Project. Based on this analysis, the USACE finds that the Project discussed in the DEIS is consistent with the goals and policies of the CMP to the maximum extent practicable.

The following provides a summary of actions designed to comply with the specific requirements of §501.14(h–k, and m).

The purpose of the CMP is to effectively manage Texas' coastal resources through goals and policies established by the Coastal Coordination Council. Thus, certain State and Federal actions should be consistent with the established goals and policies of the CMP. For Federal permits for development, dredging, or dredged material placement in critical areas (coastal wetlands, SAV, oyster reefs, tidal sand or mud flats), a certificate of compliance with water quality requirements must be issued.

Section 501.14(h) Development in Critical Areas.

(1) *Dredging and construction of structures in, or the discharge of dredged or fill material into, critical areas shall comply with the policies in this subsection. In implementing this subsection, cumulative and secondary adverse effects of these activities will be considered.*

(A) *The policies in this subsection shall be applied in a manner consistent with the goal of achieving no net loss of critical area functions and values.*

Compliance: The project has been designed to minimize adverse impacts to critical areas, by following an existing dredged channel for the majority of the alignment and by extending the new channel through an intermittently open washover pass. The channel was sited to avoid seagrasses to the extent possible.

- (B) *Persons proposing development in critical areas shall demonstrate that no practicable alternative with fewer adverse effects is available.*
 - (i) *The person proposing the activity shall demonstrate that the activity is water-dependent. If the activity is not water-dependent, practicable alternatives are presumed to exist, unless the person clearly demonstrates otherwise.*
 - (ii) *The analysis of alternatives shall be conducted in light of the activity's overall purpose.*
 - (iii) *Alternatives may include different operation or maintenance techniques or practices or a different location, design, configuration, or size.*

Compliance: The project will provide access to the Gulf of Mexico and the dredging of which will provide sand for beach restoration. Thus, it is water dependent. As identified in Section 556 of the Water Resources Development Act (WRDA) of 1999 (P.L. 106-53), and House of Representatives Conference Report (H.R. 106-298), the USACE will construct the locally preferred plan if it is found to be technically sound and environmentally acceptable. Alternatives were discussed in Section 2.0 of this FEIS.

- (C) *In evaluating practicable alternatives, the following sequence shall be applied:*
 - (i) *Adverse effects on critical areas shall be avoided to the greatest extent practicable.*
 - (ii) *Unavoidable adverse effects shall be minimized to the greatest extent practicable by limiting the degree or magnitude of the activity and its implementation.*
 - (iii) *Appropriate and practicable compensatory mitigation shall be required to the greatest extent practicable for all adverse effects that cannot be avoided or minimized.*

Compliance: Three alternative sites, including Packery Channel, were evaluated. Three different channel widths under three different salinity regimes were also examined to determine the environmental benefits of an opening between the Laguna Madre and the Gulf of Mexico. The environmental benefits of all alternatives were essentially negligible. Based on this information, only the proposed action was fully developed and compared with the No-Action alternative in this FEIS.

Unavoidable adverse impacts to critical areas have been minimized by shifting the channel alignment to avoid beds of submerged aquatic vegetation. The City of Corpus Christi has committed to enforce a no-wake zone to minimize shoreline erosion adjacent to the Mollie Beattie Habitat Community. The channel design incorporated benched areas upslope from the channel bottom to support shallow water habitat for potential seagrass recruitment should conditions be suitable. These areas are

not considered as mitigation. The City of Corpus Christi, responsible to the GLO and the School Land board, will work through the CBBEP to perform mitigation on Shamrock Island.

(D) *Compensatory mitigation includes restoring adversely affected critical areas or replacing adversely affected critical areas by creating new critical areas. Compensatory mitigation should be undertaken, when practicable, in areas adjacent or contiguous to the affected critical areas (on-site). If on-site compensatory mitigation is not practicable, compensatory mitigation should be undertaken in close physical proximity to the affected critical areas if practicable and in the same watershed if possible (off-site). Compensatory mitigation should also attempt to replace affected critical areas with critical areas with characteristics identical to or closely approximating those of the affected critical areas (in-kind). The preferred order of compensatory mitigation is:*

- (i) *on-site, in-kind;*
- (ii) *off-site, in-kind;*
- (iii) *on-site, out-of-kind; and*
- (iv) *off-site, out-of-kind.*

Compliance: Loss of approximately 5.4 acres of SAV beds and 1.9 acres of tidal flats are estimated. Proposed secondary recreational development will impact 0.3 acre of tidal flats. A mitigation plan for impacts to seagrass has been developed by the non-Federal sponsor (responsible to the GLO and the School Land Board) to protect and enhance Shamrock Island, including seagrass establishment. Through funding of \$1,250,000 and working through the Coastal Bend Bays and Estuaries Program, the mitigation plan will be implemented.

(E) *Mitigation banking is acceptable compensatory mitigation if use of the mitigation bank has been approved by the agency authorizing the development and mitigation credits are available for withdrawal. Preservation through acquisition for public ownership of unique critical areas or other ecologically important areas may be acceptable compensatory mitigation in exceptional circumstances. Examples of this include areas of high priority for preservation or restoration, areas whose functions and values are difficult to replicate, or areas not adequately protected by regulatory programs. Acquisition will normally be allowed only in conjunction with preferred forms of compensatory mitigation.*

Compliance: Not applicable.

(F) *In determining compensatory mitigation requirements, the impaired functions and values of the affected critical area shall be replaced on a one-to-one ratio. Replacement of functions and values on a one-to-one ratio may require restoration or replacement of the physical area affected on a ratio higher than one-to-one. While no net loss of critical area functions and values is the goal, it is not required in individual cases where mitigation is not practicable or would result in only inconsequential environmental benefits. It is also important to recognize that there are circumstances where the adverse effects of the*

activity are so significant that, even if alternatives are not available, the activity may not be permitted regardless of the compensatory mitigation proposed.

Compliance: Loss of 5.4 acres of patchy seagrass beds will be compensated by an approved plan by the GLO and the City of Corpus Christi for protecting and enhancing Shamrock Island, including SAV creation.

- (G) *Development in critical areas shall not be authorized if significant degradation of critical areas will occur. Significant degradation occurs if:*
- (i) *the activity will jeopardize the continued existence of species listed as endangered or threatened, or will result in likelihood of the destruction or adverse modification of a habitat determined to be a critical habitat under the Endangered Species Act, 16 United States Code Annotated, §§1531-1544;*
 - (ii) *the activity will cause or contribute, after consideration of dilution and dispersion, to violation of any applicable surface water quality standards established under subsection (f) of this section;*
 - (iii) *the activity violates any applicable toxic effluent standard or prohibition established under subsection (f) of this section;*
 - (iv) *the activity violates any requirement imposed to protect a marine sanctuary designated under the Marine Protection, Research, and Sanctuaries Act of 1972, 33 United States Code Annotated, Chapter 27; or*
 - (v) *taking into account the nature and degree of all identifiable adverse effects, including their persistence, permanence, areal extent, and the degree to which these effects will have been mitigated pursuant to subparagraphs (C) and (D) of this paragraph, the activity will, individually or collectively, cause or contribute to significant adverse effects on:*
 - (I) *human health and welfare, including effects on water supplies, plankton, benthos, fish, shellfish, wildlife, and consumption of fish and wildlife;*
 - (II) *the life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, or spread of pollutants or their byproducts beyond the site, or their introduction into an ecosystem, through biological, physical, or chemical processes;*
 - (III) *ecosystem diversity, productivity, and stability, including loss of fish and wildlife habitat or loss of the capacity of a coastal wetland to assimilate nutrients, purify water, or reduce wave energy; or*
 - (IV) *generally accepted recreational, aesthetic or economic values of the critical area which are of exceptional character and importance.*

Compliance. The proposed project will not jeopardize the continued existence of species listed as endangered or threatened. The proposed channel and jetty construction will remove approximately 1.5 acres of critical habitat for the piping plover, primarily along the beach and shore that is part of a county park beach. Approximately 24.6 acres of beach within the critical habitat area will be temporarily impacted with sand placement for beach nourishment. The proposed beach nourishment will restore beach erosion in these areas and also provide additional forage habitat for the piping plover.

The proposed activity violates no Texas Water Quality Standard and will impact no marine sanctuary.

The proposed project will not contribute to significant adverse effects on the human health and welfare, aquatic organisms and wildlife or their habitat, ecosystem diversity or health, or recreation.

- (2) *The TNRCC and the RRC shall comply with the policies in this subsection when issuing certifications and adopting rules under Texas Water Code, Chapter 26, and the Texas Natural Resources Code, Chapter 91, governing certification of compliance with surface water quality standards for Federal actions and permits authorizing development affecting critical areas; provided that activities exempted from the requirement for a permit for the discharge of dredged or fill material, described in Code of Federal Regulations, Title 33, §323.4 and/or Code of Federal Regulations, Title 40, §232.3, including but not limited to normal farming, silviculture, and ranching activities, such as plowing, seeding, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices, shall not be considered activities for which a certification is required. The GLO and the SLB shall comply with the policies in this subsection when approving oil, gas, or other mineral lease plans of operation or granting surface leases, easements, and permits and adopting rules under the Texas Natural Resources Code, Chapters 32, 33 and 51-53, and Texas Water Code, Chapter 61, governing development affecting critical areas on state submerged lands and private submerged lands, and when issuing approvals and adopting rules under Texas Civil Statutes, Article 5421u, for mitigation banks operated by subdivisions of the state.*

Compliance: No certification is required from the RRC, but information is supplied in the FEIS pertinent to a TCEQ Section 401 water quality certification.

- (3) *Agencies required to comply with this subsection will coordinate with one another and with Federal agencies when evaluating alternatives, determining appropriate and practicable mitigation, and assessing significant degradation. Those agencies' rules governing authorizations for development in critical areas shall require a demonstration that the requirements of paragraph (1)(A)-(G) of this subsection have been satisfied.*

Compliance: Information is supplied in this FEIS relative to TCEQ Section 401 water quality certification, the Texas Coastal Management Plan, and those Federal laws and regulations noted in Section 7.0 of the FEIS.

- (4) *For any dredging or construction of structures in, or discharge of dredged or fill material into, critical areas that is subject to the requirements of §501.15 of this title (relating to Policy for Major Actions), data and information on the cumulative and secondary adverse affects of the project*

need not be produced or evaluated to comply with this subsection if such data and information is produced and evaluated in compliance with §501.15(b)-(c) of this title (relating to Policy for Major Actions).

Compliance: This project involves action subject to §501.15 and constitutes a major action. Coordination has occurred among the State and Federal agencies having jurisdiction over the proposed activity and the FEIS will be sent to them. Additionally, cumulative impacts are considered in Section 5.0 of this FEIS.

Section 501.14(i) Construction of Waterfront Facilities and Other Structures on Submerged Lands.

(1) *Development on submerged lands shall comply with the policies in this subsection.*

- (A) *Marinas shall be designed and, to the greatest extent practicable, sited so that tides and currents will aid in flushing of the site or renew its water regularly.*

Compliance: Not applicable.

- (B) *Marinas designed for anchorage of private vessels shall provide facilities for the collection of waste, refuse, trash, and debris.*

Compliance: Not applicable.

- (C) *Marinas with the capacity for long-term anchorage of more than ten vessels shall provide pump-out facilities for marine toilets, or other such measures or facilities that provide an equal or better level of water quality protection.*

Compliance: Not applicable.

- (D) *Marinas, docks, piers, wharves and other structures shall be designed and, to the greatest extent practicable, sited to avoid and otherwise minimize adverse effects on critical areas from boat traffic to and from those structures.*

Compliance: Not applicable.

- (E) *Construction of docks, piers, wharves, and other structures shall be preferred instead of authorizing dredging of channels or basins or filling of submerged lands to provide access to coastal waters if such construction is practicable, environmentally preferable, and will not interfere with commercial navigation.*

Compliance: Not applicable.

- (F) *Piers, docks, wharves, bulkheads, jetties, groins, fishing cabins, and artificial reefs (including artificial reefs for compensatory mitigation) shall be limited to the minimum necessary to serve the project purpose and shall be constructed in a manner that:*

- (i) *does not significantly interfere with public navigation;*
- (ii) *does not significantly interfere with the natural coastal processes which supply sediments to shore areas or otherwise exacerbate erosion of shore areas; and*
- (iii) *avoids and otherwise minimizes shading of critical areas and other adverse effects.*

Compliance: As identified in Section 556 of the WRDA of 1999 and House of Representatives Conference Report (H.R. 106-298), the USACE will construct the locally preferred plan for Packery Channel. The locally preferred plan has been found to be technically sound and environmentally acceptable. This project has been designed to provide storm damage reduction by beach nourishment and environmental restoration by opening an outlet to the Gulf. The project will also provide access to the Gulf for recreational boaters. The vessel size limit is based on the structural limitations of the SH 361 bridge over Packery Channel. A sand bypassing system is proposed at the jetties to redistribute accreted sand as beach nourishment to the eroded shoreline.

- (G) *Facilities shall be located at sites or designed and constructed to the greatest extent practicable to avoid and otherwise minimize the potential for adverse effects from:*
- (i) *construction and maintenance of other development associated with the facility;*
 - (ii) *direct release to coastal waters and critical areas of pollutants from oil or hazardous substance spills or stormwater runoff; and*
 - (iii) *deposition of airborne pollutants in coastal waters and critical areas.*

Compliance: The project location was defined by Section 556 of WRDA 1999 (P.L. 106-53), and House of Representatives Conference Report (H.R. 106-298), and the USACE is instructed to construct the locally preferred plan that is found to be technically sound and environmentally acceptable. No adverse impacts to other development, no release of oil or hazardous substances are anticipated, although the potential exists (albeit small). No stormwater runoff and no deposition of significant airborne pollution are expected. These items are addressed in this FEIS.

- (H) *Where practicable, pipelines, transmission lines, cables, roads, causeways, and bridges shall be located in existing rights-of-way or previously disturbed areas if necessary to avoid or minimize adverse effects and if it does not result in unreasonable risks to human health, safety, and welfare.*

Compliance: Though not part of the Project, proposed park roads or road expansions for related City of Corpus Christi recreational development will be designed to minimize adverse effects and built with human safety in mind. Underground utility placement has also been designed in locations that minimize adverse effects.

- (I) *To the greatest extent practicable, construction of facilities shall occur at sites and times selected to have the least adverse effects on recreational uses of CNRAs and on spawning or nesting seasons or seasonal migrations of terrestrial and aquatic wildlife.*

Compliance: The timing of beach placement and the construction of the channel and jetties will require coordination with the non-Federal sponsor and Federal agencies to determine the appropriate season for construction activities on the beach but, overall, the activity will increase opportunity for recreational uses. The beach areas are used by the public and also as foraging habitat for the piping plover and other shorebirds.

- (J) *Facilities shall be located at sites which avoid the impoundment and draining of coastal wetlands. If impoundment or draining cannot be avoided, adverse effects to the impounded or drained wetlands shall be mitigated in accordance with the sequencing requirements of subsection (h) of this section. To the greatest extent practicable, facilities shall be located at sites at which expansion will not result in development in critical areas.*

Compliance: No impounding or draining of wetlands is expected.

- (K) *Where practicable, piers, docks, wharves, bulkheads, jetties, groins, fishing cabins, and artificial reefs shall be constructed with materials that will not cause any adverse effects on coastal waters or critical areas.*

Compliance: Construction materials used for this project will not cause any adverse effects on coastal waters or critical areas.

- (L) *Developed sites shall be returned as closely as practicable to pre-project conditions upon completion or cessation of operations by the removal of facilities and restoration of any significantly degraded areas, unless:*
- (i) *the facilities can be used for public purposes or contribute to the maintenance or enhancement of coastal water quality, critical areas, beaches, submerged lands, or shore areas; or*
 - (ii) *restoration activities would further degrade CNRAs.*

Compliance: All areas temporarily disturbed by equipment, temporary roads, or material shall be restored to the original or better conditions, except those designed for public purposes.

- (M) *Water-dependent uses and facilities shall receive preference over those uses and facilities that are not water-dependent.*
- (N) *Nonstructural erosion response methods such as beach nourishment, sediment bypassing, nearshore sediment berms, and planting of vegetation shall be preferred instead of structural erosion response methods.*

Compliance: This is a water-dependent project. Sand dredged from the proposed channel will be deposited on the beach to aid in restoration of the eroding beach. Beach nourishment is proposed for two areas located north and south of the proposed jetties. A sand bypass system will be used to transfer accreted sand from either side of the jetty to the appropriate beach location for nourishment.

- (O) *Major residential and recreational waterfront facilities shall to the greatest extent practicable accommodate public access to coastal waters and preserve the public's ability to enjoy the natural aesthetic values of coastal submerged lands.*

- (P) *Activities on submerged land shall avoid and otherwise minimize any significant interference with the public's use of and access to such lands.*

Compliance: The channel will not significantly interfere with the public's use and access to the beach. The channel construction will provide additional access to recreation activities for boating, fishing, and use of the beach.

- (Q) *Erosion of Gulf beaches and coastal shore areas caused by construction or modification of jetties, breakwaters, groins, or shore stabilization projects shall be mitigated to the extent the costs of mitigation are reasonably proportionate to the benefits of mitigation. Factors that shall be considered in determining whether the costs of mitigation are reasonably proportionate to the cost of the construction or modification and benefits include, but are not limited to, environmental benefits, recreational benefits, flood or storm protection benefits, erosion prevention benefits, and economic development benefits.*

Compliance: The proposed project will provide storm damage protection by placing material along the eroding shoreline.

- (2) *To the extent applicable to the public beach, the policies in this subsection are supplemental to any further restrictions or requirements relating to the beach access and use rights of the public.*

Compliance: The City of Corpus Christi, non-Federal, will provide guidelines for beach construction activities on the public beach areas.

- (3) *The GLO and the SLB, in governing development on state submerged lands, shall comply with the policies in this subsection when approving oil, gas, and other mineral lease plans of operation and granting surface leases, easements, and permits and adopting rules under the Texas Natural Resources Code, Chapters 32, 33 and 51-53, and Texas Water Code, Chapter 61.*

Compliance: The City of Corpus Christi, as non-Federal, has negotiated with the General Land Office.

Section 501.14(j) Dredging and Dredged Material Disposal and Placement

- (1) *Dredging and the disposal and placement of dredged material shall avoid and otherwise minimize adverse effects to coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches to the greatest extent practicable. The policies of this subsection are supplemental to any further restrictions or requirements relating to the beach access and use rights of the public. In implementing this subsection, cumulative and secondary adverse effects of dredging and the disposal and placement of dredged material and the unique characteristics of affected sites shall be considered.*

Compliance: Construction dredging and jetty placement of the proposed Packery Channel would impact 5.2 acres of submerged aquatic vegetation, approximately 4.8 acres of high salt marsh, 1.8 acres of primary/secondary dune complexes, 0.1 acre of tidal flats, and 9.2 acres of beach. The channel alignment was altered as much as practicable to avoid seagrasses. Approximately 6.8 acres of Gulf of Mexico bottom habitat will be impacted by the excavation of the channel and 7.1 acres for placement of fill for the jetties. A sand bypass system will be installed to remove sand that accumulates updrift of the jetties. This material, in addition to much of the construction material, will be used for beach nourishment (a beneficial use) at PA 4, totaling 86.7 acres. Impacts to coastal communities from the placement of dredged material in the placement areas will displace approximately 3.8 acres of channel fill sands, 10.1 acres of primary/secondary dune complexes, and 0.1 acre of beach for PA 1; 4.4 acres of high salt marsh, 1.0 acre of tidal flats, and 8.3 acres of primary/secondary dune complexes; and 0.1 acre of submerged aquatic vegetation, 2.2 acres of emergent wetlands (low and high salt marsh), 0.2 acre of algal flats, and 1.8 acres of upland grasslands for PA 3. Placement material at the MMPA would potentially impact 0.1 acre of submerged aquatic vegetation, 6.4 acres of high salt marsh, 0.6 acre of tidal flats, 3.3 acres of upland grasslands, and 0.1 acre of open water. Potential secondary recreational development will impact 0.3 acre of tidal flats, 3.7 acres of primary/secondary dune complexes, and 3.8 acres of beach.

- (A) *Dredging and dredged material disposal and placement shall not cause or contribute, after consideration of dilution and dispersions to violation of any applicable surface water quality standards established under subsection (f) of this section.*

Compliance: For placement areas, adequate dilution and dispersion occurs so as not to violate applicable surface water quality standards. The materials from the proposed channel area have been tested and meet standards (FEIS Sections 3.2.3, 3.3, 4.2, 4.3).

- (B) *Except as otherwise provided in subparagraph (D) of this paragraph, adverse effects on critical areas from dredging and dredged material disposal or placement shall be avoided and otherwise minimized, and appropriate and practicable compensatory mitigation shall be required, in accordance with subsection (h) of this section.*

Compliance: Some critical areas (coastal wetlands, submerged aquatic vegetation, and tidal flats) will be affected by the project but others may be created. Shallow-water habitat (approximately 3.6 acres) will be created above the channel bottoms on side benches to allow for potential SAV establishment. No SAV will be planted and this is not considered as SAV mitigation. Beach nourishment is proposed for

approximately 86.7 acres. The City of Corpus Christi will work through the CCBEP to perform the required mitigation under the responsibility of the GLO and the School Land Board for establishing seagrass and protecting and enhancing Shamrock Island.

(C) *Except as provided in subparagraph (D) of this paragraph, dredging and the disposal and placement of dredged material shall not be authorized if:*

(i) *there is a practicable alternative that would have fewer adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches, so long as that alternative does not have other significant adverse effects;*

Compliance: Channel construction and placement of new work and maintenance material have been designed to minimize adverse impacts the environment. The proposed channel deepening and widening is following an existing channel for approximately 2.6 miles, thus minimizing impacts to undisturbed areas. The new portion of the channel extending 0.9 mile is designed to use an historic, intermittent washover area. Other alternatives evaluated resulted in greater adverse impacts to the environment.

(ii) *all appropriate and practicable steps have not been taken to minimize adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches; or*

Compliance: All practicable steps have been taken to minimize adverse effects on these resources. Natural areas outside of the project will be demarcated as off-limits to construction activities. The City of Corpus Christi's dune protection permit application to relocate approximately 5,670 cy of dunes (approximately 1.5 acres) within the Project has been approved by the GLO.

(iii) *significant degradation of critical areas under subsection (h)(1)(G)(v) of this section would result.*

Compliance: Some critical areas will be affected by the project, as noted above. However, these have been minimized. Creation of shallow-water habitat will occur in the channel, and eroding beach areas will be nourished with sand from new work and maintenance material. A mitigation plan to address impacts has been approved between the GLO and the City of Corpus Christi.

(D) *A dredging or dredged material disposal or placement project that would be prohibited solely by application of subparagraph (C) of this paragraph may be allowed if it is determined to be of overriding importance to the public and national interest in light of economic impacts on navigation and maintenance of commercially navigable waterways.*

Compliance: Application of subparagraph (C) does not prohibit the construction or maintenance of Packery Channel. Dredging is necessary to reopen and maintain Packery Channel.

- (2) *Adverse effects from dredging and dredged material disposal and placement shall be minimized as required in paragraph (1) of this subsection. Adverse effects can be minimized by employing the techniques in this paragraph where appropriate and practicable.*

Compliance: Adverse effects of dredging and disposal as described in this FEIS have been minimized as described under "Compliance" for paragraph (1) of this subsection.

- (A) *Adverse effects from dredging and dredged material disposal and placement can be minimized by controlling the location and dimensions of the activity. Some of the ways to accomplish this include:*

- (i) *locating and confining discharges to minimize smothering of organisms;*
- (ii) *locating and designing projects to avoid adverse disruption of water inundation patterns, water circulation, erosion and accretion processes, and other hydrodynamic processes;*
- (iii) *using existing or natural channels and basins instead of dredging new channels or basins, and discharging materials in areas that have been previously disturbed or used for disposal or placement of dredged material;*
- (iv) *limiting the dimensions of channels, basins, and disposal and placement sites to the minimum reasonably required to serve the project purpose, including allowing for reasonable overdredging of channels and basins, and taking into account the need for capacity to accommodate future expansion without causing additional adverse effects;*
- (v) *discharging materials at sites where the substrate is composed of material similar to that being discharged;*
- (vi) *locating and designing discharges to minimize the extent of any plume and otherwise control dispersion of material; and*
- (vii) *avoiding the impoundment or drainage of critical areas.*

Compliance: Changes in water circulation, and thus salinity, will have a minor improvement to fisheries. The existing channel and basins are being utilized to the extent practicable. Most discharged material will be used for beach nourishment. No impoundment or draining of critical areas will occur.

- (B) *Dredging and disposal and placement of material to be dredged shall comply with applicable standards for sediment toxicity. Adverse effects from constituents contained in materials discharged can be minimized by treatment of or limitations on the material itself. Some ways to accomplish this include:*

- (i) *disposal or placement of dredged material in a manner that maintains physicochemical conditions at discharge sites and limits or reduces the potency and availability of pollutants;*
- (ii) *limiting the solid, liquid, and gaseous components of material discharged;*
- (iii) *adding treatment substances to the discharged material; and*
- (iv) *adding chemical flocculants to enhance the deposition of suspended particulates in confined disposal areas,*

Compliance: While there are no standards for sediment toxicity, sediments to be dredged from Packery Channel have been tested for a variety of chemical parameters of concern to resource agencies. Sediments located in Packery Channel reveal trace metal contaminants, as is common for the Upper Laguna Madre. All non-sandy material will be placed in upland confined placement areas. A summary of this information is included in the FEIS.

- (C) *Adverse effects from dredging and dredged material disposal or placement can be minimized through control of the materials discharged. Some ways of accomplishing this include:*
 - (i) *use of containment levees and sediment basins designed, constructed, and maintained to resist breaches, erosion, slumping, or leaching;*
 - (ii) *use of lined containment areas to reduce leaching where leaching of chemical constituents from the material is expected to be a problem;*
 - (iii) *capping in-place contaminated material or, selectively discharging the most contaminated material first and then capping it with the remaining material;*
 - (iv) *properly containing discharged material and maintaining discharge sites to prevent point and nonpoint pollution; and*
 - (v) *timing the discharge to minimize adverse effects from unusually high water flows, wind, wave, and tidal actions.*

Compliance: All non-sandy material will be placed in upland confined placement areas. Sandy material will be used beneficially to nourish nearby beaches.

- (D) *Adverse effects from dredging and dredged material disposal or placement can be minimized by controlling the manner in which material is dispersed. Some ways of accomplishing this include:*
 - (i) *where environmentally desirable, distributing the material in a thin layer;*

- (ii) *orienting material to minimize undesirable obstruction of the water current or circulation patterns;*
- (iii) *using silt screens or other appropriate methods to confine suspended particulates or turbidity to a small area where settling or removal can occur;*
- (iv) *using currents and circulation patterns to mix, disperse, dilute, or otherwise control the discharge;*
- (v) *minimizing turbidity by using a diffuser system or releasing material near the bottom;*
- (vi) *selecting sites or managing discharges to confine and minimize the release of suspended particulates and turbidity and maintain light penetration for organisms; and*
- (vii) *setting limits on the amount of material to be discharged per unit of time or volume of receiving waters.*

Compliance: PA 1 will drain into the Inner Basin, while the MMPA will drain into Reach 2 of the channel. Both areas will use water control structures that will allow the water level within the PAs to be manipulated to provide ponding that would promote the settling of fine-grained material. During dredging operations, the quality of the TSS in the effluent will be regulated by adjusting either the outlet weir or the rate of dredging, as appropriate. Contract specifications will require the contractor to monitor effluent quality and ensure that dredging operations will not result in TSS levels that exceed 300 mg/l.

PAs 2 and 3 will be used to receive material that is mechanically excavated. Therefore, there will not be return water associated with these areas. Some incidental water may be entrained during mechanical dredging from the channel between Stations 136+50 and 140+53; but the amount of water removed is considered to be *de minimis*.

PAs 4S and 4N are unconfined beach placement areas. Material will be discharged directly onto the beach for nourishment purposes. Small temporary retaining dikes will be constructed to help hold the material. No water control structures will be used in these areas.

(E) *Adverse effects from dredging and dredged material disposal or placement operations can be minimized by adopting technology to the needs of each site. Some ways of accomplishing this include:*

- (i) *using appropriate equipment, machinery, and operating techniques for access to sites and transport of material, including those designed to reduce damage to critical areas;*
- (ii) *having personnel on site adequately trained in avoidance and minimization techniques and requirements; and*

- (iii) *designing temporary and permanent access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and high water flows, accommodate fluctuating water levels, and maintain circulation and faunal movement.*

Compliance: Dredging and placement of dredged material will be from water-based equipment and mechanical excavation. A sand bypass system will be installed to reduce future maintenance dredging at the mouth of the channel. Adjacent natural areas to the project will be demarcated as off-limits to construction activities.

- (F) *Adverse effects on plant and animal populations from dredging and dredged material disposal or placement can be minimized by:*
 - (i) *avoiding changes in water current and circulation patterns that would interfere with the movement of animals;*
 - (ii) *selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species that have a competitive edge ecologically over indigenous plants or animals;*
 - (iii) *avoiding sites having unique habitat or other values including habitat of endangered species;*
 - (iv) *using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics;*
 - (v) *using techniques that have been demonstrated to be effective in circumstances similar to those under consideration whenever possible and, when proposed development and restoration techniques have not yet advanced to the pilot demonstration stage, initiating their use on a small scale to allow corrective action if unanticipated adverse effects occur;*
 - (vi) *timing dredging and dredged material disposal or placement activities to avoid spawning or migration seasons and other biologically critical time periods; and*
 - (vii) *avoiding the destruction of remnant natural sites within areas already affected by development.*

Compliance: Changes in water circulation will provide minor but positive benefits. No sites that are advantageous to predators or non-indigenous species are proposed. Unique habitat in the project impact area includes 1.5 acres of piping plover critical habitat, which will be dredged for the channel. Approximately 20.0 acres of beach nourishment will be placed onto critical habitat areas, resulting in temporary impacts. Beach placement of new material will require coordination with FWS to ensure compliance with ESA requirements for the project. All appropriate material will be used for beach nourishment.

(G) *Adverse effects on human use potential from dredging and dredged material disposal or placement can be minimized by:*

- (i) selecting sites and following procedures to prevent or minimize any potential damage to the aesthetically pleasing features of the site, particularly with respect to water quality;*
- (ii) selecting sites which are not valuable as natural aquatic areas;*
- (iii) timing dredging and dredged material disposal or placement activities to avoid the seasons or periods when human recreational activity associated with the site is most important; and*
- (iv) selecting sites that will not increase incompatible human activity or require frequent dredge or fill maintenance activity in remote fish and wildlife areas.*

Compliance: Opening Packery Channel will increase recreational boating opportunities. Beach nourishment and proposed secondary recreational development will increase the aesthetics of the area but decrease it for others. A sand bypass system will be installed to reduce dredging frequency at the mouth of the channel. Placement of sand on the beach may temporarily restrict use of the area by the public for recreational use.

(H) *Adverse effects from new channels and basins can be minimized by locating them at sites:*

- (i) that ensure adequate flushing and avoid stagnant pockets; or*
- (ii) that will create the fewest practicable adverse effects on CNRAs (Coastal Natural Resource Areas) from additional infrastructure such as roads, bridges, causeways, piers, docks, wharves, transmission line crossings, and ancillary channels reasonably likely to be constructed as a result of the project; or*
- (iii) with the least practicable risk that increased vessel traffic could result in navigation hazards, spills, or other forms of contamination which could adversely affect CNRAs;*
- (iv) provided that, for any dredging of new channels or basins subject to the requirements of §501.15 of this title (relating to Policy for Major Actions), data and information on minimization of secondary adverse effects need not be produced or evaluated to comply with this subparagraph if such data and information is produced and evaluated in compliance with §501.15(b)(1) of this title (relating to Policy for Major Actions).*

Compliance: Adequate flushing will occur. Adverse effects, including those to CNRAs, have been minimized. A mitigation plan between the GLO and the City of Corpus Christi has been developed to

establish seagrass and protect and enhance Shamrock Island to replace estuarine habitats from the Project impacts. The channel and jetty design accounted for the safety of recreational boating.

- (3) *Disposal or placement of dredged material in existing contained dredge disposal sites identified and actively used as described in an environmental assessment or environmental impact statement issued prior to the effective date of this chapter shall be presumed to comply with the requirements of paragraph (1) of this subsection unless modified in design, size, use, or function.*

Compliance: No existing placement areas are proposed for use in this project.

- (4) *Dredged material from dredging projects in commercially navigable waterways is a potentially reusable resource and must be used beneficially in accordance with this policy.*

Compliance: All new work and maintenance material from this project, which has the proper characteristics, is being used beneficially for beach nourishment/shoreline protection.

- (A) *If the costs of the beneficial use of dredged material are reasonably comparable to the costs of disposal in a non-beneficial manner, the material shall be used beneficially.*
- (B) *If the costs of the beneficial use of dredged material are significantly greater than the costs of disposal in a non-beneficial manner, the material shall be used beneficially unless it is demonstrated that the costs of using the material beneficially are not reasonably proportionate to the costs of the project and benefits that will result. Factors that shall be considered in determining whether the costs of the beneficial use are not reasonably proportionate to the benefits include, but are not limited to:*
- (i) *environmental benefits, recreational benefits, flood or storm protection benefits, erosion prevention benefits, and economic development benefits;*
 - (ii) *the proximity of the beneficial use site to the dredge site; and*
 - (iii) *the quantity and quality of the dredged material and its suitability for beneficial use.*
- (C) *Examples of the beneficial use of dredged material include, but are not limited to:*
- (i) *projects designed to reduce or minimize erosion or provide shoreline protection;*
 - (ii) *projects designed to create or enhance public beaches or recreational areas;*
 - (iii) *projects designed to benefit the sediment budget or littoral system;*
 - (iv) *projects designed to improve or maintain terrestrial or aquatic wildlife habitat;*
 - (v) *projects designed to create new terrestrial or aquatic wildlife habitat, including the construction of marshlands, coastal wetlands, or other critical areas;*

- (vi) *projects designed and demonstrated to benefit benthic communities or aquatic vegetation;*
 - (vii) *projects designed to create wildlife management areas, parks, airports, or other public facilities;*
 - (viii) *projects designed to cap landfills or other waste disposal areas;*
 - (ix) *projects designed to fill private property or upgrade agricultural land, if cost-effective public beneficial uses are not available; and*
 - (x) *projects designed to remediate past adverse impacts on the coastal zone.*
- (5) *If dredged material cannot be used beneficially as provided in paragraph (4) (B) of this subsection, to avoid and otherwise minimize adverse effects as required in paragraph (1) of this subsection, preference will be given to the greatest extent practicable to disposal in:*
- (A) *contained upland sites;*
 - (B) *other contained sites; and*
 - (C) *open water areas of relatively low productivity or low biological value.*

Compliance: All new work and maintenance material from this project, which has the proper characteristics, is being used beneficially for beach nourishment/shoreline protection. Material not capable of being used beneficially will be placed in upland confined placement areas.

- (6) *For new sites, dredged materials shall not be disposed of or placed directly on the boundaries of submerged lands or at such location so as to slump or migrate across the boundaries of submerged lands in the absence of an agreement between the affected public owner and the adjoining private owner or owners that defines the location of the boundary or boundaries affected by the deposition of the dredged material.*

Compliance: The new confined upland placement area will affect submerged lands, as will the placement areas along the side of the channel and east of SH 361. All placement areas are confined. The new beach nourishment/ shoreline protection placement area will affect submerged lands but will be of overall net environmental benefit.

Section 501.14 (k) Construction in the Beach/Dune System.

(1) *Construction in critical dune areas and adjacent to Gulf beaches shall comply with the policies in this subsection.*

(A) *Construction within a critical dune area that results in the material weakening of dunes and material damage to dune vegetation shall be prohibited.*

Compliance: This project will negatively impact approximately 20.2 acres of primary and secondary dune complexes. Proposed secondary recreational development would potentially affect an additional 3.7 acres of primary and secondary dune complexes. However, less than 6 acres would be within the critical dune area. This is possible because the new portion of the channel is being dredged through the historic channel/washover area for Packery Channel. Additionally, §63.121 defines critical dune areas as those dune areas that "are essential to the protection of State-owned lands, public beaches, and submerged land." The construction of the proposed activity will not affect dune areas such that State-owned lands, public beaches, or submerged lands will be endangered. Almost all of the impacts will be from PAs 1 and 2 and access roads, all of which will be designed to be stable and not lead to erosion of surrounding dune complexes. Furthermore, the City of Corpus Christi proposes to mitigate for displaced dunes (5,670 cy encompassing approximately 1.5 acres) by relocating them immediately to the northeast in a depression area and revegetating the dunes to approximate the natural formed position, sediment content, volume, elevation, and vegetative cover.

(B) *Construction within critical dune areas that does not materially weaken dunes or materially damage dune vegetation shall be sited, designed, constructed, maintained, and operated so that adverse "effects" (as defined in §15.2 of this title (relating to Coastal Area Planning)) on the sediment budget and critical dune areas are avoided to the greatest extent practicable. For purposes of this subsection, practicability shall be determined by considering the effectiveness, scientific feasibility, and commercial availability of the technology or technique. Cost of the technology or technique shall also be considered. Adverse effects (as defined in Chapter 15 of this title (relating to Coastal Area Planning)) that cannot be avoided shall be:*

- (i) *minimized by limiting the degree or magnitude of the activity and its implementation;*
- (ii) *rectified by repairing, rehabilitating, or restoring the adversely affected dunes and dune vegetation; and*
- (iii) *compensated for on-site or off-site by replacing the resources lost or damaged seaward of the dune protection line.*

Compliance: 5,670 cy of affected dunes (approximately 1.5 acres) will be relocated to a depression landward of the foredune ridge.

- (C) *Rectification and compensation for adverse effects that cannot be avoided or minimized shall provide at least a one-to-one replacement of the dune volume and vegetative cover, and preference shall be given to stabilization of blowouts and breaches and on-site compensation.*

5,670 cy of displaced dunes will be mitigated by relocating the displaced dunes to a site immediately northeast of PA 2 to a depression landward of the existing foredune ridge. The 5,670 cy of critical dunes will be restored to simulate the natural position, sediment content, volume, elevation, and vegetative cover (City of Corpus Christi, 2002b). The City of Corpus Christi proposes to revegetate using native species that will provide the same or greater protective capability as the surrounding natural dunes.

- (D) *The ability of the public, individually and collectively, to exercise its rights of use of and access to and from public beaches shall be preserved and enhanced.*

Compliance: Public beach access will be provided on both sides of the proposed channel.

- (E) *Non-structural erosion response methods such as beach nourishment, sediment bypassing, nearshore sediment berms, and planting of vegetation shall be preferred instead of structural erosion response methods. Subdivisions shall not authorize the construction of a new erosion response structure within the beach/dune system, except for a retaining wall located more than 200 feet landward of the line of vegetation. Subdivisions shall not authorize the enlargement, improvement, repair or maintenance of existing erosion response structures on the public beach. Subdivisions shall not authorize the repair or maintenance of existing erosion response structures within 200 feet landward of the line of vegetation except as provided in §15.6(d) of this title (relating to Concurrent Dune Protection and Beachfront Construction Standards).*

Compliance: Beach nourishment is proposed on both sides of the jetties along the eroding shoreline. Relocated dunes will simulate the natural position, sediment content, volume, elevation, and vegetative cover of the displaced critical dune complex.

- (2) *The GLO shall comply with the policies in this subsection when certifying local government dune protection and beach access plans and adopting rules under the Texas Natural Resources Code, Chapters 61 and 63. Local governments required by the Texas Natural Resources Code, Chapters 61 and 63, and Chapter 15 of this title (relating to Coastal Area Planning) to adopt dune protection and beach access plans shall comply with the applicable policies in this subsection when issuing beachfront construction certificates and dune protection permits.*

Compliance: Not applicable.

Section 501.14(m) Development Within Coastal Barrier Resource System Units and Otherwise Protected Areas on Coastal Barriers.

(1) *Development of new infrastructure or major repair of existing infrastructure within or supporting development within Coastal Barrier Resource System Units and Otherwise Protected Areas designated on maps dated October 24, 1990, under the Coastal Barrier Resources Act, 16 United States Code Annotated, §3503(a), shall comply with the policies in this subsection.*

(A) *Development of publicly funded infrastructure shall be authorized only if it is essential for public health, safety, and welfare, enhances public use, or is required by law.*

Compliance: A Storm Damage Reduction and Environmental Restoration Project at North Padre Island, Texas, was authorized by Section 556 of WRDA 1999 (P.L. 106-53), and House of Representatives Conference Report (H.R. 106-298). Therefore, the project is required by law.

(B) *Infrastructure shall be located at sites at which reasonably foreseeable future expansion will not require development in critical areas, critical dunes, Gulf beaches, and washover areas within Coastal Barrier Resource System Units or Otherwise Protected Areas.*

Compliance: No reasonably foreseeable future expansion is proposed for the Project. However, proposed secondary recreational development by the City of Corpus Christi would entail impacts on CNRAs. Any secondary development spurred by the proposed activity would be governed by applicable State and Federal laws and regulations.

(C) *Infrastructure shall be located at sites that to the greatest extent practicable avoid and otherwise minimize the potential for adverse effects on critical areas, critical dunes, Gulf beaches, and washover areas within Coastal Barrier Resource System Units or Otherwise Protected Areas from:*

(i) *construction and maintenance of roads, bridges, and causeways; and*

(ii) *direct release to coastal waters, critical areas, critical dunes, Gulf beaches, and washover areas within Coastal Barrier Resource System Units or Otherwise Protected Areas of oil, hazardous substances, or stormwater runoff.*

Compliance: Standard construction techniques for the coastal area, which provide adequate safeguards for critical areas will be required by the plans and specifications for the project. No release of oil, hazardous substances, or stormwater runoff is expected.

- (D) *Where practicable, infrastructure shall be located in existing rights-of-way or previously disturbed areas to avoid or minimize adverse effects within Coastal Barrier Resource System Units or Otherwise Protected Areas.*

Compliance: The proposed channel deepening and widening is following an existing channel for approximately 2.6 miles, thus minimizing impacts to undisturbed areas. The new portion of the channel, extending 0.9 mile, is designed to use an historic, intermittent washover area.

- (E) *Development of infrastructure shall occur at sites and times selected to have the least adverse effects practicable within Coastal Barrier Resource System Units or Otherwise Protected Areas on critical areas, critical dunes, Gulf beaches, and washover areas and on spawning or nesting areas or seasonal migrations of commercial, recreational, threatened, or endangered terrestrial or aquatic wildlife.*

Compliance: The timing of beach placement will require coordination with the non-Federal sponsor and Federal agencies to determine the appropriate season for construction activities on the beach. The beach areas are used by the public and also as foraging habitat for the Federally listed piping plover. Placement of dunes will simulate the natural position of those to be displaced by the project.

- (2) *TNRCC rules and approvals for the creation of special districts and for infrastructure projects funded by issuance of bonds by water, sanitary sewer, and wastewater drainage districts under Texas Water Code, Chapter 50; water control and improvement districts under Texas Water Code, Chapter 50; municipal utility districts under Texas Water Code, Chapter 54; regional plan implementation agencies under Texas Water Code, Chapter 54; special utility districts under Texas Water Code, Chapter 65; stormwater control districts under Texas Water Code, Chapter 66; and all other general and special law districts subject to and within the jurisdiction of the TNRCC, shall comply with the policies in this subsection. TxDOT rules and approvals under Texas Civil Statutes, Article 6663 et seq, governing planning, design, construction, and maintenance of transportation projects, shall comply with the policies in this subsection.*

Compliance: Not applicable.

Section 501.15 Policy for Major Actions

- (A) *For purposes of this section, "major action" means an individual agency or subdivision action listed in §505.11 of this title (relating to Actions and Rules Subject to the Coastal Management Program), §506.12 of this title (relating to Federal Actions Subject to the Coastal Management Program), or §505.60 of this title (relating to Local Government Actions Subject to the Coastal Management Program), relating to an activity for which a Federal Environmental Impact Statement under the National Environmental Policy Act, 42 United States Code Annotated, §4321, et seq is required.*
- (B) *Prior to taking a major action, the agencies and subdivisions having jurisdiction over the activity shall meet and coordinate their major actions relating to the activity. The agencies and subdivisions shall, to the greatest extent practicable, consider the cumulative and secondary adverse effects, as described in the Federal Environmental Impact Assessment process, of each major action relating to the activity.*
- (C) *No agency or subdivision shall take a major action that is inconsistent with the goals and policies of this chapter. In addition, an agency or subdivision shall avoid and otherwise minimize the cumulative adverse effects to coastal natural resource areas of each of its major actions relating to the activity.*

Compliance: This project constitutes a major action. Therefore, a Federal EIS is required under NEPA, 42 USC, §4321, et seq. Federal and State agencies have met and coordinated on the project design and impacts. The purpose of this portion of the EIS is to demonstrate that the proposed project is consistent with the TCMP.

APPENDIX C

DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) COMMENTS, RESPONSES, AND CONCURRENCE

APPENDIX C-1

PUBLIC COMMENTS AND RESPONSES

Texas Review and Comment System
Review Notification

Applicant/Origination Agency: Department of the Army/Galveston District Corps

Contact Name: Mr. Randy L. Turner

Contact Phone: 409/766-3914

Email:

Project Name: Packery Channel-North Padre Island Storm Damage Reduction

Funding Agency:

SAI/EIS#: TX-I-20000828-0001-50

Date Received: 8/28/2000

Date Comments Due BPO:

9/27/2000

Review Participants

Agencies

Texas Historical Commission
Dr. James Bruseh
TRACS Coordinator
1511 Colorado Street
Austin, Texas

Texas Parks & Wildlife Department
Mr. Robert W. Spain
Chief, Habitat Assessment Branch
4200 Smith School Road
Austin, Texas

Texas Natural Resource Conservation
Commission
Ms. Mary Lively
Office of Policy & Regulatory Dev. MC205
P. O. Box 13087
Austin, Texas

Cogs

Houston-Galveston Area Council
Ms. Rowena Ballas
Admin. Assistant., Programs
P.O. Box 22777
Houston, TX 77227

Special Notes/Comments:

Summary of application provided by SPOC. Reviewers should contact applicant directly to receive a full copy for review.

☒ **No Comment**

Return Comments to:

Review Agency

Signature

Denise S. Francis / MUR

Denise S. Francis, State Single Point of Contact
Governor's Office of Budget & Planning
P.O. Box 12428
Austin, TX 78711
(512) 305-9415

A01-01

Comment

Response

A01-01

Thank you for your comment.

North Padre Island -- Packery Channel

The Water Resources Development Act of 1999 (WRDA 99) gave direction to the Secretary of the Army to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island, if the Secretary determines that the work is technically sound and environmentally acceptable.

Project Formulation

Nueces County, the local project sponsor at that time, engaged the services of Naismith Engineering, Inc., to design a project for the reopening of Packery Channel. This plan became known as the "locally preferred plan." In February 2000, the City of Corpus Christi, in an agreement with Nueces County, became the local sponsor for the project.

The Galveston District, U.S. Army Corps of Engineers, is currently evaluating the locally preferred plan for technical soundness and environmental acceptability. The plan consists of a 12-foot deep channel, rock jetties extending into the Gulf of Mexico, bulkheads and two public recreational parks. Also included in the plan is restoration of the seawall in the vicinity of Packery Channel.

Project Timeline

North Padre Island--Packery Channel

	2000				2001			
	1st QTR	2nd QTR	3rd QTR	4th QTR	1st QTR	2nd QTR	3rd QTR	4th QTR
Analysis for Technical Soundness								
Evaluation for Environmental Acceptability								
Completion of NEPA Documentation								

City of Corpus Christi

Packery Channel Project



US Army Corps
of Engineers
Galveston District

send to
Attn: PE-P
P.O. Box 1229
Galveston TX 77553

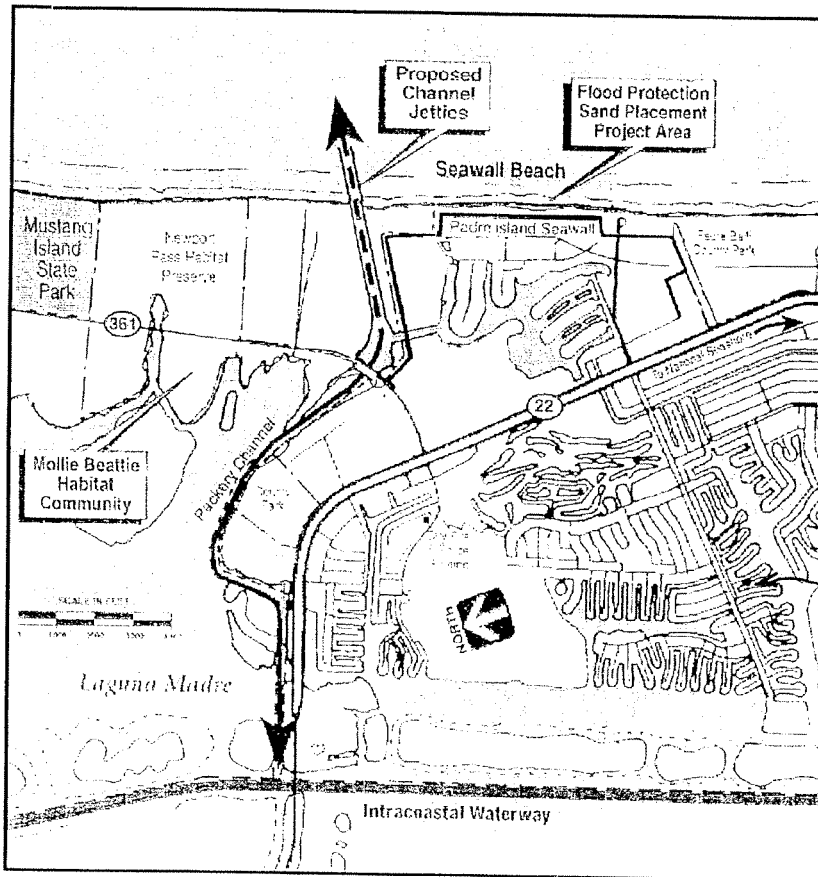
Project Background

Packery Channel is a natural pass separating Padre and Mustang Islands. This inlet connecting Corpus Christi Bay and the Gulf of Mexico closed in 1912 after dredging of a 12-foot deep boat channel from the Aransas Pass inlet into Corpus Christi Bay. It has remained closed since the late 1920's, except for temporary opening by storms, due to stabilization of Aransas

Pass and deepening of the Corpus Christi Ship Channel.

Efforts to reopen Packery Channel were initiated in the 1980s, primarily by private interests. But at that time, no local governmental entity was willing to become the project sponsor or to develop a funding mechanism to move the project forward. In 1996, Nueces County and the Port of Corpus Christi Authority joined to seek a fresh, technical appraisal of the project and a review of all earlier work.

The proposed Packery Channel will extend from the Gulf of Mexico through a jettied entrance, and a channel through Mustang Island, east and adjacent to the John F. Kennedy Causeway, therein to the existing Packery Channel, joining the main channel of the Gulf Intracoastal Waterway.



Subj: Packery Channel
Date: 08/28/2000 12:21:22 PM Central Daylight Time
From: jvandekreeke@rsmas.miami.edu (Co Vandekreeke)
To: turfpar@aol.com

Dear Mrs Spencer,

Yes I was part of a review committee that specifically reviewed two reports
- Packery Channel Feasibility Study: Inlet Functional Design and Sand Management Study by N.C. Kraus and D.J. Heilman. Technical Report TAMU-CC-CBI-96-06
- Packery Channel Feasibility study: Bay Circulation and Waterlevel by C.A. Brown and A. Miltello. Technical Report TAMU-CC-CBI-96-07
These reports were prepared by the Conrad Blucher Institute for Surveying and Science of Texas A and M University. They were prepared for Naismith Engineering Inc.

Besides myself other members of the review committee were Dr Miles . O. Hayes of Research Planning Inc. and Dr R.G. Dean, University of Florida.

Our review was carried at te request of the Texas General Land Office. Stephen F. Austin Building. 1700 North Congress Avenue. Austin, Texas 7801-5001. I assume that you can request a copy of our review from their office. The title of our report is "Packery Channel Opening: Peer Review Panel Assessment" June 13, 1997. The persons we were dealing with at the Texas General Land Office were Tom Nuckols (512-463-5054) and Bill Worsham (512-463-9215)

By the way opening an inlet under the disguise of that it allows you to dredge sand to be used for beachfill is utter nonsense. When you open an inlet the inlet will catch sand that otherwise would have travelled to the downdrift beaches. It is this sand that has to be dredged and transferred. This has to be done periodically. I seem to the remember that this was one of the concern of the review committee. Who is responsible for transferring this sand? There might be a considerable interest in the inlet at this time, but what will happen in the future. Who guarantees the funds to dredge the sand? If the sand is not transferred, the downdrift beaches could be subject to severe erosion. In this respect I quote from the report: "Overall we believe that if Nueces County, as Project Sponsor, is committed to maintaining the channel in perpetuity through a rigorous sand management program, the Packery Channel project can be viable".

Hope this is of some help.

Co van de Kreeke
Professor
Applied Marine Physics

----- Headers -----

Return-Path: <jvandekreeke@rsmas.miami.edu>

Received: from rly-yb02.mx.aol.com (rly-yb02.mail.aol.com [172.18.146.2]) by air-yb05.mail.aol.com (v75_b3.11) with ESMTP; Mon, 28 Aug 2000 13:21:22 -0400

Received: from umigw.miami.edu (umigw.miami.edu [129.171.97.1]) by rly-yb02.mx.aol.com (v75_b3.9) with ESMTP; Mon, 28 Aug 2000 13:20:58 -0400

Received: (qmail 12559 invoked by uid 7794); 28 Aug 2000 17:20:54 -0000

Comment**Response**

A02-01

A sand bypass system has been included as an integral part of the present project. For construction, the USACE and the City are jointly responsible for the project. For maintenance, the City is responsible, including the sand bypass system.

5 September 2000

to: Mr. Rick Medina
U S Army Corps of Engineers
P.O. Box 1229
Galveston, Tx 77553-1229

re: Packery Channel

Dear Mr. Medina.

I am unable to attend the Sept. 7th scoping meeting in Corpus Christi concerning the Packery Channel project, and wish to submit my comments in writing.

The Packery proposal is an ill-conceived project which will not result in a navigable channel from the Gulf of Mexico to the Intercoastal waterway. It will provide a viable boat pass only to one private marina development (Lake Padre), and a ludicrously restricted access for everyone else.

A03-01

The Packery proposal constitutes a gross misuse of public land and money for the benefit of a private project. The proposed pass would cut through the most heavily used beach in the Coastal Bend area, cutting off pedestrian access to the beach for all the tourists staying at the hotels and condominiums behind the seawall.

A03-02

The City's proposal will do nothing to improve the existing low bridge across Packery Channel. The bridge has only a 20' clearance height. No sailboat and no sizable outrigger fishing boat can pass under the bridge. Moreover, the bridge does not provide a clear span across the channel; instead, it has rows of concrete support columns and water-level tie beams beneath it. Boats must run through slots between the column rows to pass below the bridge. Water current velocities will be accelerated through the bridge narrows making navigation very treacherous and dangerous. Boats which lose power or misjudge the wind and water velocity may founder and crash into the column/beam rows resulting in damaged or sunken boats, and possible injuries and loss of life.

A03-03

The increased water velocities beneath the bridge will scour the bottom deeply, potentially endangering the bridge supports. After passing below the bridge, an incoming tide water velocity will slow down and drop its suspended silt. A sand bar will likely form to the west of the bridge, further blocking navigation of the existing shallow dirt ditch channel.

A03-04

The existing dirt ditch channel is a narrow, curving, zig-zaged design over two miles long back to the Intercoastal Water Way. The Packery proposal provides nothing to deepen, widen, straighten, bulkhead, or otherwise improve the existing channel. The channel varies from 30' to 50' in width, and is 5' to 6' deep. It is surrounded by extremely shallow waters and mud flats, such that any error in judgment results in running aground. Navigation is akin to attempting to drive a car over an extremely narrow twisting country road which has deep ditches on both sides under a blanket of

A03-05

<u>Comment</u>	<u>Response</u>
A03-01	The channel as designed by URS, engineering contractor for the USACE, should provide ready boat access for anyone in a boat up to roughly 40 feet in length, with a draft of up to 4 feet.
A03-02	Project funding was authorized by Congress. Pedestrian and vehicle access would be provided both north and south of the seawall, and north of the channel.
A03-03	This Federal project is authorized as a storm damage reduction and environmental restoration project, not as a navigation project. The resulting channel can be utilized by recreational boaters, and can accommodate boats up to roughly 40 feet in length, with a draft of 4 feet. Such a vessel should encounter no problems navigating the bridge opening.
A03-04	Erosion control will extend west past the SH 361 bridge to the extent necessary to protect the bridge. Armoring of the bridge is described in the FEIS, and in greater detail in the URS report available on the Galveston district website (www.swg.usace.army.mil). Sand is not expected in maintenance material west of the Inner Basin.
A03-05	The channel west of the bridge has been deepened and widened. It could not be straightened without unacceptable impacts to SAV or other sensitive habitats. Since this is a Federal project, navigation aids will be provided by the U.S. Coast Guard. Since a No-wake zone will be instituted and enforced, navigating the channel should be much easier than it is now, and it is consistently used now.

snow. Furthermore, there exists a natural gas wellhead adjacent to the most shoaled and treacherous turn in the channel. This is the 'boat pass' which the city proposes to leave for the use of the entire populace of Corpus Christi and Nueces County, except for the Lake Padre users. Only the proposed 'Lake Padre' would enjoy a monopoly on sail access, deep sea fishing, and excursion charters. The City's Packery Channel proposal is not a true public work with equal access for all users, but an inequitable pass largely to the benefit of one private development at the public's expense and loss of beach.

A03-06

The Tax Increment Funding proposal is flawed and inadequate. It provides only around 1/4 million dollars per year for dredging maintenance, but the true maintenance dredging costs are estimated at around one million dollars per year, leaving a shortfall of 3/4 million dollars per year to be made up out of tax money. There is no guarantee that the developer will successfully pay off the bonds, but even if he is, the City will have to pay the maintenance costs in perpetuity thereafter. The funding proposal provides for inadequate length jetties out into the Gulf. Construction costs will be substantially higher than provided for.

If Packery Pass is cut across the beach, we will lose the protection of the barrier island in case of storm. The barrier island provides a three to four hour delay in storm tide flooding aiding evacuation of Padre Island and the Flour Bluff Shore. The Kennedy Causeway and Laguna Shores Rd. will go under water hours earlier if Packery Pass is cut. Erosion and storm damage will create property losses to the existing residents along Packery Channel.

A03-07

The City's Packery Channel proposal is Technically, morally, and financially unsound, and is unworthy of the Corps of Engineers involvement.

Sincerely,



Train Serbu
14310 Playa del Rey
Corpus Christi, Tx. 78418
(361) 949-7250

<u>Comment</u>	<u>Response</u>
A03-06	As noted, navigation aids will be provided, boats will be going slowly because of the enforced No-wake Zone, and the gas well is highly visible.
A03-07	<p>Surge was evaluated by URS (URS, 2002) for several scenarios, including the 10-year recurrence storm, the 50-year recurrence storm, a high-flow storm, and low-flow summer condition. The model used was the one-dimensional HEC-RAS model, which was calibrated to the data from the two-dimensional model used by Brown and Militello (1997). Data for the 10-year storm and the 50-year storm were taken from a flood insurance study for Nueces County by FEMA (FEMA, 1992) and data for the other two were from typical summer low-flow conditions and a tropical storm of unknown recurrence from Brown and Militello (1997). Results included the water surface and average channel velocity at numerous locations along Packery Channel. Data from near the intersection of Packery Channel and the GIWW (Station 12+58, see Figure 1-3 of the FEIS) are as follows: summer low-flow, water surface = 0.11', velocity = 0.08 fps; 10-year storm, water surface = 2.2', velocity = 0.31 fps; 50-year storm, surface 8.32', velocity, 0.08 fps; high-flow storm, water surface = 2.1', velocity, 0.22 fps. The counter-intuitive velocity results for the 10-year and 50-year storms is because the island is overtopped and the channel is just a deeper part of the island and is no longer a significant conduit. Thus, when significant flow occurs, the channel makes little difference. Likewise, when the channel is acting as a conduit and the flow opens out into the large Upper Laguna Madre, the effect of the channel is reduced to non-significance. Brown and Militello (1997) concluded "because of the small cross-sectional area of Packery Channel relative to the cross-sectional area of the Corpus Christi Ship Channel and the volume of the bay system, the opening of Packery Channel is expected to have minimal influence on the bay water level. Simulations indicate that there would not be substantial change in water level variations at the JFK Causeway; therefore, low-lying sections of the roadway are not expected to experience increased incidence or rate of flooding if Packery Channel is re-opened." The Peer Review Panel report (Hayes, van Kreeke, and Dean 1997) agreed with Brown and Militello (1997) relative to flooding inside Corpus Christi Bay during storm events. The channel will not contribute to increased storm damage and erosion.</p>



County of Nueces

September 7, 2000

Mr. Randy L. Turner,
Major, Corps of Engineers
Acting District Engineer
Department of the Army
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas, 77553-1229

RE: Packery Channel-North Padre Island Damage Reduction and Environmental
Restoration Project, Corpus Christi, Texas

Dear Major Turner,

Thank you for allowing comment on this project. In your notice of this PUBLIC SCOPING meeting, you stated you were: **"especially soliciting comments/concerns on environmental issues including:"**

RESOURCES OF PARTICULAR CONCERN;
OPPORTUNITIES FOR THE BENEFICIAL USES OF DREDGED
MATERIAL; AND DEVELOPMENT OF A LONG-TERM DISPOSAL
PLAN

Since I am not a scientist or an engineer I will not attempt to speak or sound like one on the items you are soliciting comments. However, I would like to share with you some comments from folks that are qualified by their education and professional training.

In a letter dated November 26, 1997, Jamie Rappaport Clark, Director of the United States Department of the Interior, Fish and Wildlife Service responded to a letter co-signed by Senator Phil Gramm, Senator Kay Bailey Hutchison and Congressman Solomon Ortiz. The Gramm-Hutchison-Ortiz letter requested the Fish and Wildlife Service to provide information about the proposal to reopen Packery Channel.

JOE McCOMB

County Commissioner, Precinct Four • Corpus Christi, Texas 78401
County Courthouse • 901 Leopard, Room 303.11
Telephone: 361-888-0268 • Fax: 361-888-0470
P. O. Box 1689 • Corpus Christi, Texas 78403

Since the response letter is three pages, I will point out just a couple of the responses. The first quote is related to the "BENEFICIAL USES OF DREDGED MATERIAL":

USFWS COMMENT: *"The sand removed during the projects initial and maintenance dredging can be used to restore beach and vehicular access to a heavily eroded stretch in front of the North Padre Island seawall a few thousand feet south of Packery Channel. Other proposed uses of the dredged sand include construction of dunes to enhance North Padre Island's hurricane protection and aesthetic features."*

The next quotes are related to ecological issues:

USFWS COMMENT: *"In the mid-1980's, while searching for alternatives to offset the impacts of construction of the U.S. Navy's homeport project at Point Ingleside, Texas, the Fish and Wildlife Service assessed the potential salinity-related effects of reopening Packery Channel. Using models designed to predict salinity effects on the brown shrimp and the spotted sea trout, we estimated that the reopening's impact on these species would adequately mitigate the Navy project's impacts. The Fish and Wildlife Service, National Marine Fisheries Service, and Texas Parks and Wildlife Department all recommended the alternative of reopening the channel to the Navy,..."*

USFWS COMMENT: *"Shrimp, trout, threatened piping plovers, and other species would benefit from the reopening. The moderation in the Upper Laguna Madre's salinity caused by mixing its waters with the less saline waters of the Gulf of Mexico would be accompanied by a moderation of the cooler lagoon's temperature. We expect that these changes will encourage the growth of smooth cordgrass and black mangroves, and promote habitat diversity without displacing habitats important to species like the piping plover. Oysters historically thrived in the washover pass areas at the southern end of Mustang Island when Packery Pass and nearby passes were open, but became scarce in the high Laguna Madre salinities that prevailed when the passes closed. Permanently reopening the channel is expected to once more ensure that live oyster reefs are a feature of Kate's and Deadman's Holes, two popular fishing sites in Laguna Madre near Packery Channel."*

I am sure you have copies of all the studies, reports and other related material that were produced while Nueces County was the project sponsor. While time does not allow me to go into detail about all the information contained in those reports, I would like to point out some rather significant comments on the quality of the feasibility study done by

Joe McComb / Nueces County Commissioner - Precinct 4
P. O. Box 1689 Corpus Christi, Texas, 78403
361/888-0268 (ph) 361/888-0470 (fax)

the Conrad Blucher Institute at Texas A & M University-Corpus Christi, under the direction of Dr. Nicholas C. Kraus.

These comments are about a Peer Review Report on the work done by Dr. Kraus and the Conrad Blucher Institute, which was ordered by and paid for by the Texas General Land Office. The letter dated June 24, 1997 from Garry Mauro, who at the time was, Texas Land Commissioner are as follows:

TXGLO COMMENT: "The quality of the final report reflects the peer review panel's objectivity, experience with Texas coastal processes, and expertise in the fields of coastal geology, coastal engineering, and numerical modeling."

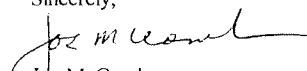
"The peer review panel found no fundamental flaws with the CBI studies. They concluded that the design for the project is "reasonable and that the channel should perform well"..."

"The panel found that the studies are based on solid science and are sound from a technical perspective. One strength of the studies is that, rather than relying on a single approach to all issues, they examined issues using different approaches so that results could be compared. The panel also found that there were no serious "data gaps."

As I stated earlier, I am no scientist or engineer but these are comments from folks who are, and they are extremely supportive of this project based on facts and good science.

North Padre Island is in my precinct as County Commissioner. I have seen the erosion problem and know the problems we will have if we ever lose the seawall. I encourage you to move forward with this "STORM DAMAGE REDUCTION AND ENVIRONMENTAL RESTORATION PROJECT." IT IS A PROJECT WHOSE TIME HAS COME!

Sincerely,


Joe McComb

Comments submitted for Corps of Engineers Public Scoping Meeting (Packery Channel)
September 7, 2000, Bayfront Convention Center / Room 220
7:00pm - 9:00pm
Corpus Christi, Texas

Joe McComb / Nueces County Commissioner - Precinct 4
P. O. Box 1689 Corpus Christi, Texas, 78403
361/888-0268 (ph) 361/888-0470 (fax)

A04-01

Comment

Response

A04-01

Thank you for you comments.



**PADRE ISLAND
BUSINESS ASSOCIATION**

Sept. 7, 2000

Department of the Army
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, TX 77553-1229

Gentlemen:

This letter is to make you aware of the vigorous support that the Padre Island Business Association and the Padre Island business community has for the Packery Channel - North Padre Island Storm Damage Reduction and Environmental Restoration Project. This project solves an important problem that has been of critical concern of our community for many years.

We know you understand the critical importance that sand replenishment has for our seawall and the development on Padre Island. This latest plan you are considering has developed a relative economical way to replenish the sand in front of the seawall and offers an economical method to continuously replenish it in the future. Our base flood elevations for all development is based on this crucial protective seawall. For or continued safety, our economical stability, and our future growth, we must have your support to move ahead with this project.

The board of directors of the Padre Island Business Association and all the business community implores you to move ahead with this momentous project.

Sincerely,

Bill Goin
President

A05-01

Comment

Response

A05-01

Thank you for you comments.

Richard L. Watson, Ph.D.
Consulting Geologist
P.O. Box 1040
Port Aransas, Tx 78373
(361) 749-4152 (253) 981-0412 fax
cell (361) 779-0980 rwatson@centurytel.net

Comments for COE Packery Scoping Meeting

September 7, 2000

The predictions and analysis that I made in 1996 and 1997 about the problems with the plans to open Packery Channel are coming true one by one.

1. Correction of the math used in the Kraus study showed that the pass will not be stable and successful as the proponents claimed, but will tend to shoal and become unsafe for navigation with rapid growth of a shallow bar at the channel entrance.

A06-01

2. The peer review panel found that the surf sand transport system will bring 412,000 cubic yards of channel choking sand to the pass. This is double the amount estimated in the proponents study. The PBS&J study of environmental effects raised this estimate to 500,000 cubic yards per year. This is two to three times the estimate of the Kraus study and near to the 750,000 cubic yards per year that we found to be the supply of sand to the nearby Fish Pass 25 years ago.

3. PBS&J estimates annual maintenance dredging by using the numbers from Mansfield Pass. They predict an annual dredging and jetty maintenance cost of \$292,000 using a dredging cost of \$1.50 per cubic yard. Shiner, Moseley and Associates in the January 2000, Galveston County Comprehensive Gulf Shoreline Erosion Response Plan indicate that present dredging costs are a minimum of \$3 to \$5 per cubic yard. This present day pricing shows that the annual dredging cost will be between \$584,000 and \$973,000 dollars per year. This is well within the range of \$500,000 to \$1,500,000 that I estimated long ago.

A06-02

4. It gets worse! Due to the low and narrow bridge, any dredge which is capable of initially digging the pass or maintaining it, must approach the pass from the Gulf side; it will be unable to get under the bridge. Pipeline dredges are NOT seaworthy vessels and the entire time the dredge is in the Gulf, it will be in danger of sinking. It will not be safe, until it has dredged its way into calm water. This likely means that dredging costs will be much higher than the annual estimate of \$600,000 to \$1,000,000 based on current costs. The dredging company will demand more money because of the greater risk of their dredge sinking, if strong winds occur before they can dredge their way into calm water. This risk will be present each time the pass is dredged, not just during initial construction. This is a negligible risk at most inlets, because the dredge can approach from the inland side and can always retreat to calm water. Even so a dredge sank in the mouth of Mansfield Pass a few years ago.

A06-03

5. The PBS&J study found Packery Channel will produce no environmental benefits or salinity reduction in Laguna Madre, false conclusions still touted by Packery proponents.

6. The jetties are far too short and the pass is too shallow. The jetties are designed to be 1200 ft. to 1400 ft. long (about the length of Bob Hall Pier), with a design depth of about 11 ft. This will place the seaward end of the

A06-04

A06-05

<u>Comment</u>	<u>Response</u>
A06-01	A new engineering study was conducted for the USACE by URS. It used newly generated wind and wave data, and did not rely on earlier studies, to insure independence. The jetty design was based on this new study. The shoaling rates and quantities reported in the FEIS were developed from the URS studies.
A06-02	The costs of the project were also recalculated by URS and the USACE. These are the costs included in the FEIS.
A06-03	The phasing of construction work will be determined by the contractor awarded the construction contract. However, it is anticipated that a portable dredge will be brought in by land and will begin dredging the new channel from the Inner Basin east to the Gulf. From the SH 361 bridge west to the GIWW, a smaller dredge will be used, either imported by land or down the GIWW to the channel.
A06-04	Actually, the study found small benefits from all the alternatives. Please see Section 2 of the FEIS for a discussion of the benefits and detriments of the South and Fish Pass alternatives compared to the Packery Channel alternative, and why the first two were eliminated from further consideration.
A06-05	The new engineering study by URS for the USACE indicated that the jetty design is sound.

<p>jetties well within breaking surf as many as 75 days per year. There will be breaking waves within the jetty channel. This will rapidly transport sand into the channel and will very rapidly build a shallow bar in the entrance. Even smaller waves will break on the shallow bar, rendering the entrance unsafe for navigation. The fish pass was built with jetties only 400 feet shorter than the Packery jetties and it filled from an 11 foot depth in the entrance to less than 4 feet in only 5 months!</p>	
<p>There is no greater hazard to navigation than a breaking inlet. Inexperienced boaters will go out in the morning when it is calm and return in the afternoon when the wind has risen and find breaking waves in the entrance. An outgoing tidal flow will make the situation even worse. The jetty length needs to be increased at least another 1000 feet. This will raise the initial construction cost at least \$10 million dollars! For safe navigation, the minimum dredge depth needs to be at least 16 to 18 feet and the seaward end of the jetties need to end in that depth of water.</p>	A06-06
<p>7. The bridge is too low and too narrow. Corps of Engineers regulations require that they only build inlets to reduce flooding, improve environmental conditions or for commercial vessel navigation. It has been shown that Packery will not accomplish the first two and may, in fact, speed up flooding during the onset of hurricane surge tides. Packery will be totally unsuitable for commercial vessel navigation because of its shallow depth and the restriction of a narrow bridge with only 21 ft. of vertical clearance. Almost no commercial vessels can navigate it. In fact, no sail boats can pass under the bridge. It will be a pass only good for outboards and very small inboard motorboats. Most inboard offshore sportfishing boats cannot pass under the bridge.</p>	A06-07
<p>8. There needs to be serious shoreline stabilization and bulkheading in front of the homes which are located at the bend just west of the bridge. Even though the flow through the pass will be too low to keep it kept free of sand, the initial flow after dredging will be substantial. There is a similar bend just west of the bridge at the Fish Pass. Even though the fish pass entrance filled to less than 4 feet in 5 months, the initial flow was high enough to cause rapid erosion at the bend. The state had to move rapidly to install bulkheading because a large natural gas pipeline was eroded and in danger of failing. This bulkheading is still visible in the sand filled Fish Pass just west of the bridge. This should be accomplished prior to opening the pass to protect the property of the homeowners along the pass. Their houses are located on the outside of a sharp bend and the channel is likely to rapidly erode in their direction.</p>	A06-08
<p>9. Building Packery Channel with the longer jetties needed and realistic estimates of annual dredging maintenance are going to greatly increase both the initial construction costs and the annual maintenance far above the present estimates. In 1996, I stated that it would cost \$50 million to build Packery when the proponents were saying it could be built for \$11 million. They are now up to \$30 million with the same short jetties. Expect a construction cost of \$50 million or more for a navigationally safe pass, and a maintenance cost in excess of \$1,000,000 every year. This will double the City's share of the cost, even before construction begins.</p>	A06-09
<p>10. The tremendous financial benefits will probably only be realized by the developer of the land gulfward of the bridge. It is unlikely that North Padre will turn into Fort Lauderdale. South Padre island has fantastic development, but very little of that is due to the pass. They have only one big offshore fishing boat, even though they have a ship inlet. Port Aransas has one of the best inlets in the United States and plenty of available land, but it is no Fort Lauderdale.</p>	A06-10
<p>How can you expect a shallow, dangerous, expensive inlet to work a financial miracle, when it has not happened at really good inlets on the same coast.</p>	

Comment**Response**

- A06-06 The length of the jetties was analyzed by URS and an additional 30 feet were added to the original Naismith design. Beyond the additional 30 feet, there was no advantage versus the cost of lengthening the jetty. Increasing the depth of the channel would have no bearing on the safety of the vessels using the channel.
- A06-07 The Galveston District website (www.swg.usace.army.mil) lists the various functions of the District. This Federal project is authorized as a storm damage reduction and environmental restoration project, not as a navigation project. The resulting channel can be utilized by recreational boaters, and can accommodate boats up to roughly 40 feet in length, with a draft of 4 feet. Such a vessel should encounter no problems navigating the bridge opening. Also please see Response to Comment A03-07.
- A06-08 For areas west of the SH 361 bridge, tidal level and storm surge events will not significantly change from the current conditions because the Corpus Christi Ship Channel has a significantly greater influence on the water level. Thus, erosion associated with water level is not anticipated. Vessel wakes were not investigated because the City of Corpus Christi has designated the a "No Wake" zone and it is anticipated that the provisions will enforced. Current velocities were investigated for the channel extended the work performed by Brown and Militello (1997). URS (2002) showed that the velocities in channel west of SH 361 in front of the neighborhood were below 2.0 fps during storm normal conditions. At velocities below 2.0 fps, sandy soils are not susceptible to erosion and do not require armoring. Therefore, beyond the constriction imposed by the bridge, URS determined that no erosion control is necessary and there will be none.
- A06-09 The project plan presented in the FEIS has been designed to be safe and efficient.
- A06-10 Thank you for your comments.

David & Wendy Foster

14334 Playa Del Rey
Corpus Christi, Texas 78418
USA

Email silenus@pol.net

September 09, 2000

U.S. Army Corps of Engineers
Galveston District
Attn. Carl M. Anderson
P.O. Box 1229
Galveston, Texas 77552

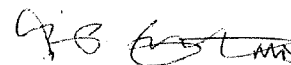
Dear Mr. Anderson,

We met at the Packery Channel Project public meeting in Corpus Christi the evening of September 7, 2000. I want to thank you again, for the opportunity to make public comments. My hope is that the Army Corp of Engineers does a complete evaluation of this project and considers every possible feature. My objective in this letter is to ensure that certain distinct concerns are brought to light during your research.

My wife and I own property on the channel. We also have a dock, approved by your Corp of Engineers, that extends from the shore to the channel itself (see enclosed). I am worried that with the opening of Packery Channel, erosion of the shoreline and damage to existing structures might ensue. I believe, if taken into consideration, plans can be made to ensure the shoreline and existing structures are protected from the additional water movement created once the channel is opened. I am uncertain if the existing channel can handle a possible increase in boat traffic, particularly if they are of the off-shore variety or are larger type vessels. I can imagine an instance where two or more of these craft might be in the channel at any one time traveling in different directions. I am unsure that there is sufficient room within the channel to safely allow the passage of several of these vessels at once. This area currently serves as a destination for fisherman, water sport enthusiasts and birders, hopefully, with the opening of the channel, care can be taken to ensure that these activities may continue.

Unfortunately, I have no answers to these problems. I am hopeful, that given enough foresight, your engineers can find solutions to these and the many other peculiarities raised in the opening of this channel. I wish you good fortune in your endeavors. Thank you again for the opportunity to voice my concerns.

Sincerely,



David P. Foster, M.D.

enclosed: photo
cc: W. Thomas Utter
Assistant City Manager
City Hall
1201 Leopard St.
P.O. Box 9277
Corpus Christi, Texas 78469-9277

A07-01

Comment**Response**

A07-01

Please see Responses to Comments A03-07 and A06-08. The channel will accommodate a vessel with a beam of 13.25', a length of 39', and draft of 4'. Two vessels of this size meeting in the channel with 10' between them, would occupy only 36.5' of an 80'-wide channel. Since there will be an enforced No-wake Zone instituted for the channel west of the SH 361 bridge and navigation aids, there should be no problems with boat traffic near your dock.

ty Foster

U.S. Army
Galveston
Attn. Carl M.
P.O. Box 122
Galveston, Tex

Dear Mr. Anderson:

We met on the morning of September 7, 2000. I want to thank you for the information that the Army Corp of Engineers does a considerable amount of research. My objective in this letter is to ensure that certain features are protected during your research.

My wife and I also have a dock, approved by your Corp of Engineers, that extends from the shoreline (see enclosed). I am worried that with the opening of Packery Channel, erosion of the shoreline and damage to existing structures might ensue. I believe, if taken into consideration, plans can be made to ensure the shoreline and existing structures are protected from the additional water movement created once the channel is opened. I am uncertain if the existing channel can handle a possible increase in boat traffic, particularly if they are of the off-shore variety or are larger type vessels. I can imagine an instance where two or more of these craft might be in the channel at any one time traveling in different directions. I am unsure that there is sufficient room within the channel to safely allow the passage of several of these vessels at once. This area currently serves as a destination for fisherman, water sport enthusiasts and birders, hopefully, with the opening of the channel, care can be taken to ensure that these activities may continue.

Unfortunately, I have no answers to these problems. I am hopeful, that given enough foresight, your engineers can find solutions to these and the many other peculiarities raised in the opening of this channel. I wish you good fortune in your endeavors. Thank you again for the opportunity to voice my concerns.

Sincerely,



David P. Foster, M.D.

enclosed: photo
cc: W. Thomas Utter
Assistant City Manager
City Hall
1201 Leopard St.
P.O. Box 9277
Corpus Christi, Texas 78469-9277

Sept. 11, 2000

US Army Corps of Engineers
Galveston District

Re: Packery Channel Project

Dear Sirs.

I am writing in support of the Packery Channel Project that you people are taking under study. I think the benefits this channel will have are long lasting both to mankind presently and for my grandchildren to come. In addition, I think with the guidance and direct supervision that you will adhere to, this will benefit Corpus Christi and the surrounding cities and towns enormously. This project is long over due to the short sightedness of many who have blocked any kind of progress in business or technology. In addition, this will enable this area my permanent home (not a winter Texan) to see the rebirth of good clean oxygenated water where fish and marine life will grow and flourish. This kind of project will see a return to things like oyster beds, clams only to mention a few of what this area had such abundance.

I am enclosing a map point out where I live and the proximity to the channel and I see no valid reason to change my vote **to proceed with the project**.

I know initially boaters will be inconvenient, fish, fishing will change, birding will ultimately find other place to nest and you guys will be able to score another victory at sea.

Call me if you need me.

Respectfully,

Sanford M. Janow

15329 Beaufort Ct

Corpus Christi, TX 78418

361 949-0654



A08-01

<u>Comment</u>	<u>Response</u>
----------------	-----------------

A08-01	Thank you for you comments.
--------	-----------------------------

Corpus Christi Rubber & Specialty Co.
2728 South Port Avenue
P.O. Box 5508
Corpus Christi, Texas 78465
FAX: 512-883-1542
TEL: 512-883-5451

QUOTATION

DATE: 9.11.00
TO: Project Manager / Packery Channel
Army Corps of Engineers



Gentlemen: in answer to your inquiry of recent date, we are pleased to submit the following prices for your consideration.

Mr. Anderson;

I would like to acknowledge my support for the opening of Packery Channel. Corpus Christi is the largest city on the Gulf without a water exchange. This project will benefit the Laguna Madre both environmentally as well as economically. I currently reside on Padre Island @

Travis Cornett
15866 Cutty Sark
Corpus Christi, TX.
78418

Good Luck,
Y. Haus

A09-01

TERMS:	APPROXIMATE SHIPPING WEIGHT
F.O.B. POINTS	APPROXIMATE SHIPPING DATE
Prices quoted are based on our receiving orders for the quantities specified. Stenographic and clerical errors are subject to correction. Above quotation is for immediate acceptance and all quoted prices, terms and conditions of sale are subject to charges without notice. All prices are subject to increase to the extent of any tax or taxes or any terms or conditions imposed by a Governmental authority. See conditions of sales on reverse side.	
Quotation valid for 30 days.	

Corpus Christi Rubber & Specialty Co.

BY

DATE

Comment

Response

A09-01

Thank you for you comments.

Drew Stevens
3317 Ridgelake Ln.
Plano, TX 75074
(972)658-2628 Cellular
(972)633-3803
(972)633-1333 Fax
YachtDr1@aol.com internet

September 16, 2000
Major, Corps of Engineers
Acting District Engineer
Department of the Army
Galveston District . Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

2019/12/00
Dear Major Turner

I am a former member of the US Coast Guard, Among other positions I have been stationed with the Aids of Navigation Unit, with a rank of G4. In addition, I am an avid boater, and very familiar with the waterways surrounding Corpus Christi.

I have been following, the progress of meetings , editorials and verbal outcries regarding Packery Channel, and I have some serious concerns.

Packery Channel

The proposed channel route appears to go below the standing bridge and through the beach known as the "surf pier". From all I have observed, the current Packery Channel, with all of it's bends and turns could not support the volume of anticipated water flow. As it stands, the waterflow would be directed into the Intercoastal Waterway, causing quite a "rip" through the narrow passes.

Fish Pass

Fish Path would provide a better route of flow. There are many who agree that if the "dog leg" in Fish Pass had been removed as part of that original project, it would still be running today as a viable pass. The jetty rocks are already on site, and would need to be extended. The exchange of water would be between the Gulf and Corpus Christi Bay, a body of water able to support the tidal changes. It would appear that the only great expenditure would be the construction of a new bridge to support vessel traffic.. The sand removed would still serve to

A10-01

A10-02

Comment**Response**

A10-01

Please see Response to Comment A03-07.

A10-02

Please see Section 2 of the FEIS for the reasons the Fish Pass alternative was eliminated from further consideration.

bolster the seawall as planned, the objections of those currently living on Packery Channel would be alleviated, and the barren flatlands around Fish Pass could serve as a base for development of parks and other attractions.

What is needed is a well thought out plan that would be a benefit to the area and not another ill-conceived project which may not only fail but take with it unrecoverable destruction of current bird nesting areas and beaches.

I would like to hear your thoughts on this idea and have my name placed on a list for any published materials.

Thank you for your attention.

Sincerely yours,



Drew Stevens

CC:

Carl Anderson, Project Manager

Jonathan Osborne, Corpus Christi Caller Times

A10-03

Comment

Response

A10-03

Your name has been added to the distribution list for NEPA documentation for this project.

Anderson, Carl M SWG

From: YachtDr22@aol.com
Sent: Saturday, September 16, 2000 8:19 AM
To: Anderson, Carl M; osbornej@caller.com
Subject: Packery Channel Project

3317 Ridgelake Lane
Plano, TX 75074

September 16, 2000
Major, Corps of Engineers
Acting District Engineer
Department of the Army
Galveston District . Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Dear Major Turner

I am a former member of the US Coast Guard. Among other positions I have been stationed with the Aids of Navigation Unit, with a rank of E-5. In addition, I am an avid boater, and very familiar with the waterways surrounding Corpus Christi.

I have been following, the progress of meetings, editorials and verbal outcries regarding Packery Channel, and I have some serious concerns.

Packery Channel

The proposed channel route appears to go below the standing bridge and through the beach known as the "surf pier". From all I have observed, the current Packery Channel, with all of its bends and turns could not support the volume of anticipated water flow. As it stands, the waterflow would be directed into the Intercoastal Waterway, causing quite a "rip" through the narrow passes.

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What is needed is a well thought out plan that would be a benefit to the area and not another ill-conceived project which may not only fail but take with it unrecoverable destruction of current bird nesting areas and beaches.

I would like to hear your thoughts on this idea and have my name placed on a list for any published materials.

Thank you for your attention.

Sincerely yours,

Drew Stevens

A11-01

Comment**Response**

A11-01

Same as previous letter, so Responses A10-01 through A10-03 apply.

CC:
Carl Anderson, Project Manager
Jonathan Osborne, Corpus Christi Caller Times

WAC

SEP 27 1990

231 Rosebud Avenue
Corpus Christi, Texas 78404
September 23, 2000

District Engineer
U. S. Army Corps of Engineers
Galveston, Texas

Dear Sir:

The upcoming study of "Packery Channel" by the Corps of Engineers should address in detail four aspects: 1) how an open channel will affect storm flooding on the islands; 2) how it will affect sand budget; 3) how the progressively receding shoreline will affect protection of the seawall; and 4) how far into the Gulf of Mexico should the offshore jetties extend to minimize sand deposition within the dredged inlet.

Comments:

Aspect One

The proposed site for the channel is in a major zone of hurricane storm surge. Currently, when sea level rises in response to surge caused by an approaching hurricane, the sea must erode its way across southern Mustang Island before reaching the bay/lagoon system. This is done by opening the Packery, Newport, and Corpus Christi storm-surge channels. The process takes several hours and thus delays flooding by the same amount of time. It has been calculated that a channel already open would cut evacuation time from the islands by some three hours. This should be addressed in the study

A12-01

Aspect Two

Since opening of the Corpus Christi Ship Channel 70+ years ago, the natural outlet to Corpus Christi Bay has been progressively filled in by sand deposition, a process by which Mustang and Padre Islands have been sedimentologically melded together. This sand has come principally from: 1) the islands themselves and the inner shelf/surf zone from whence it has been repeatedly deposited as storm-surge deltas; and 2) the southward drift of sand eroded from the backside of Mustang Island. This building process has increased the ability of the islands to hold back flooding - both by increasing the southward extent of Mustang Island and also its width. The dredging of a channel through this area will remove much of the protective sand built up over the years. Maintenance dredging will remove any further build up of sand. Thus, an area of sand accrual with increased flooding protection will become an area of sand deficiency that will increase vulnerability to flooding.

A12-02

Comment**Response**

A12-01

Please see Response to Comment A03-07.

A12-02

The material removed from channel construction will be placed on the beach in front of the seawall, and thus will replace the sand that has eroded from that area. The future maintenance material, including that from the sand bypass system, is the material that would have been distributed on the beach by longshore transport. Since the island will not be thinned and modeling has shown that flooding should not be more prominent with the channel, there is no reason to expect problems with flooding.

Aspect Three

Protection of the 4,500 ft. long sea wall and the small bulkheaded island of private property immediately behind it is the principal objective of this project, according to Senator Hutchison's Bill. The sand dredged to open the channel is to be placed in front of the seawall, both to restore the beach and to protect the seawall. Unfortunately, the beach has been removed in the first place by the process of shoreline retreat. The shoreline along this segment of the Texas coast has receded about 200 ft. over the past 30 to 35 years (a measured figure). This magnitude of retreat is predicted to continue and may increase if predictions of future sea-level rise prove correct. The retreating shoreline is progressively outflanking the the seawall, leaving it increasingly more exposed and more vulnerable to the ocean each year. If the structure is still there 30 years hence, what will be the cost of yearly protection when the shoreline will lie some 200 ft. inland of the wall (this will be especially critical to the south)? Larger and larger amounts of sand will be needed - where will it come from, and at what cost? The inner shelf does not have an adequate long-term supply. Furthermore, along a shoreline characterized by a strong southerly longshore drift, the placing of sand that is in short supply in front of a seawall to protect a small increment of private property, rather than using it instead to enhance dune build-up to protect much larger segments of the islands, is almost criminal.

A12-03

Aspect Four

Calculations by Naismith Engineering in a report done for the Nueces Commnsioners call for offshore jetties 1,450 ft. long as adequate to prevent sand build-up in the inlet. I believe this to be inadequate. The jetties should be a minimum of 2,100 ft. long but preferably 2,500 ft.

A12-04

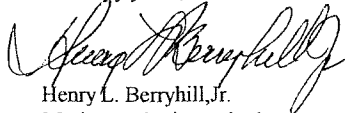
Closing statements:

1) The big issue when the dredging of Packery Channel was being pushed in the 1980's was the great benefit to fishing that would ensue as a result of the increased water exchange to the bay/lagoon system. Your study last year, also mandated by Senator Hutchison, indicated that a channel some 12 miles south of the Packery Channel site would provide the best water exchange with Laguna Madre and that a channel at Packery would have little effect. I fully concur. How do last year's findings relate to this year's study?

A12-05

2) Any long-term attempt to preserve a seawall that, in time, will be left sitting farther and farther seaward of the shoreline will be both an expensive and a losing cause.

Sincerely yours,



Henry L. Berryhill, Jr.
Marine geologist, retired
U. S. Geological Survey

Comment**Response**

A12-03

Placement of sand on the beach south of the jetties (PA 4S) will extend approximately 2000 feet south of the end of the existing seawall which will help to protect the seawall on the south end. During maintenance cycles, the City of Corpus Christi will determine where the area of greatest need for sand renourishment exists. Should the beach show significant erosion south of the seawall, the City could opt to place all of the sand on the south end of the seawall and beyond to provide protection during that particular maintenance cycle.

A12-04

New engineering studies by URS, engineering consultant for the USACE, indicate that the jetties as proposed in the FEIS are adequate.

A12-05

The results from a new modeling analysis basically did not change from the results of the earlier study. Please see Section 2 of the FEIS for a discussion relative to why the South alternative was eliminated for further consideration.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533-1229

RE: Packery Channel Project--Corpus Christi, Texas

I, and my family are IN SUPPORT of this project.

We believe it is necessary for insuring the quality of the water in our estuaries, bays and canals on Padre Island as well as to protect the seawall in times of tropical storms.

Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,



Julie Guillot
15066 Tesoro Dr.
Corpus Christi, TX 78418

A13-01

Comment

Response

A13-01

Thank you for you comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

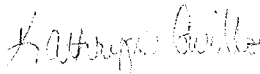
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Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,



Kathryn Guillot
15009 Dasmariñas Dr.
Corpus Christi, TX 78418

A14-01

Comment

Response

A14-01

Thank you for you comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

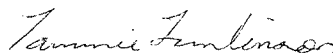
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Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,



Tammie Tumlinson
6701 Everhart Rd. Apt. 511
Corpus Christi, TX 78413

A15-01

Comment

Response

A15-01

Thank you for you comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

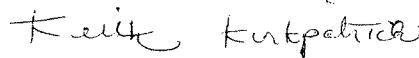
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Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,

A handwritten signature in cursive script that reads "Keith Kirkpatrick".

Keith Kirkpatrick
4821 Lake Granbury
Corpus Christi, TX 78413

A16-01

Comment

Response

A16-01

Thank you for you comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

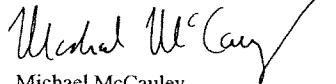
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Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael McCauley", with a long, sweeping flourish extending from the end of the name.

Michael McCauley
P. O. Box 6926
Corpus Christi, TX 78411

A17-01

Comment**Response**

A17-01

Thank you for you comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

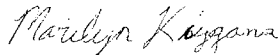
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Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,



Marilyn Kiggans
4222 Mulligan
Corpus Christi, TX 78413

A18-01

Comment

Response

A18-01

Thank you for you comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

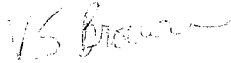
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Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,



V. S. Brown
3641 Chestnut
Corpus Christi, TX 78411

A19-01

Comment

Response

A19-01

Thank you for you comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

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Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,

Ronda Kirkpatrick

Ronda Kirkpatrick
4821 Lake Granbury
Corpus Christi, TX 78413

A20-01

Comment

Response

A20-01

Thank you for you comments.

I have heard a few people say that opening
peckery channel will not work. I am not
convinced of that. So called geologist who failed
with fish pass (who did a poor job on
that) they cannot be an expert on a
project as well studied as the
proposed ~~channel~~ Peckery Channel. We
as property owners ask you to please
give your approval for this project.
Thank You

Comment

Response

A21-01

Thank you for you comments.

John M. Trice
13706 Tajamar
Corpus Christi, Texas 78418

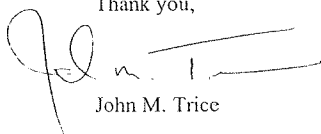
To the Army Corps of Engineers:

This is to publicly voice my support for the North Padre Island Storm Damage Reduction and Environmental Restoration Project. This project will be of tremendous benefit to the over 4,000 homeowners on Padre Island and the entire population of the United States. The project will accomplish these items by the following:

- By reopening Packery Channel it will supply a reliable and cost effective way to replenish the beach in front of the Padre Island seawall.
- Replenishing the beach in front of the Padre Island seawall will provide for the integrity of the structure, thus preserving a key component in determining FEMA flood elevation maps and providing for continued flood insurance coverage for the over 3000 homes and businesses on Padre Island. It should be noted that these structures provide a livelihood and shelter for thousands of United States citizens who pay taxes both local and Federal.
- Being proactive and protecting the Padre Island Seawall with a continuous supply of fill material from Packery Channel will prevent damage to the structure and save the Federal Government from paying large sums of money in disaster relief funds, which will reduce the burden on the United States Taxpayer. The Army Corps of Engineers will be addressing the problem before it happens with cheaper planned dollars rather than costly unplanned repair funds.

This is a very important project. It has been studied in depth and found to be feasible and substantially beneficial by a number of educated parties throughout the years. Unfortunately, today the project stands mired in half-truths, misconceptions, and rhetoric. Please look at the facts and give it your fullest support and recommendation.

Thank you,



John M. Trice

A22-01

Comment

Response

A22-01

Thank you for you comments.

STATEMENT OF GRADY PRICE BLOUNT, PH.D.
Professor of Environmental Science and Geology
Chair, Department of Physical and Life Sciences
Texas A&M University - Corpus Christi

I would like to address two points which are relevant to the scoping process for the proposal to reopen Corpus Christi Pass.

The first is the public confusion about the historical status of what we commonly call Packery Channel. The second is the responsibility of the Corps and the City of Corpus Christi in creating and encouraging an imminent environmental disaster.

In an attempt to answer the first question, myself and one of my graduate students, Mr. Michael Villarreal, have demonstrated that what we now call Packery Channel, is in fact the historical Corpus Christi Pass.

To demonstrate this fact we obtained a copy of the earliest accurately surveyed map of Corpus Christi Bay and Padre Island. This is the 1859 map by Thayer and Colton which was produced for the Corpus Christi Ship Channel Company. This map clearly shows Corpus Christi Pass which was one of the most stable and long term inlets into the bay prior to the permanent opening of Aransas Pass.

We then applied photogrammetric corrections to a 1990 satellite image (from the Landsat Thematic Mapper sensor) by utilizing GPS-derived ground control points. The 1859 map and the 1990 satellite image were then overlain with a least squares fit which allows us to make direct comparisons of changes in shoreline positions over a 131 year time period. As an example of the accuracy of this method of comparison, the currently offset location of the lighthouse at Aransas Pass is obvious.

Two points relevant to this scoping process were revealed: The first is that the historical location of Corpus Christi Pass coincides with modern day Packery Channel. Ergo, this scoping process should properly be addressing the reopening of Corpus Christi Pass, which was formerly the major entry into Corpus Christi Bay. Far from being a convenient pathway for pleasurecraft, the discussion here is about reopening a major natural pathway which has been closed for decades. The second is that position of the shoreline at the location of Corpus Christi Pass has migrated approximately 3/4 of a mile to the north and west during this same time period. By comparison, the northern end of Mustang Island and Harbor Island have experience a northwest migration of zero during this same time period.

Through constant dredging and maintenance, we have reached a sort of truce with Mother Nature in the subject of getting in and out of Corpus Christi Bay. What we have today works.

=====

The second point I wish to make this evening is about who will bear the responsibility for creating an environmental disaster after Corpus Christi Pass is reopened.

The study area is on a barrier island. By definition, it serves the environmental function of protecting the mainland from storm surges. Any simple Geology textbook classifies barrier

A23-01

A23-02

Comment**Response**

A23-01

This same conclusion was reached in Section 3.8.4 of the FEIS (See also Figure 3.8-1 in the FEIS).

A23-02

Unfortunately the rest of this letter was lost; however, please see Response to Comment A03-07 for information on storm surges..

TO PRESENT TO THE ARMY CORPS OF ENGINEERS AT THE SCOPING MEETING:

From our research, it appears that the jetties should be closer to 2400 rather than the 1400 in the Naismith report.

A24-01

It appears that the estimate of sand to be dredged is much larger than stated in Naismith report.

Storm surges would effect the channel immensely, but not considered in report. Who would be responsible for the dredging as storms might impede the completion of the project or may destroy the channel after it is completed?

A24-02

We understand there is a problem concerning the nesting places of endangered species within the zone.

A24-03

We understand that the stirring up of silt during dredging is harmful to some aquatic life.

A24-04

*

We understand that there are other less costly and more environmentally sound methods being used to replenish the beach in front of the sea walls such as an artificial barrier reef.

A24-05

JP Luby Beach will be cut in half with this channel dredging and the subsequent commercial development will destroy one of Corpus' longest and most used stretches of open beach.

A24-06

The dredging of the ship channel might be affected adversely as we understand they plan to widen and deepen it.

A24-07

A cost benefit analysis should be made to make the expense to the federal taxpayers as little as possible.

A24-08

*

According to Dr. van de Kreeke, one of the peer reviewers, placing a channel just north of the sea wall is "utter nonsense."

A24-09

We would appreciate any comments from the Army Corps of Engineers regarding these issues. Thank you.

Charles and Betty Spencer
13845 Hawksnest Bay Drive
Corpus Christi, Texas 78418
phone: 361-949-1273
email: turfpar@aol.com

*What happens if oil+gas are found under
Pacury*

<u>Comment</u>	<u>Response</u>
A24-01	We do not know what research is being referenced here, but engineering studies by URS, engineering consultant to the USACE, show that the jetties' design is sound.
A24-02	Please see Response to Comment A03-07.
A24-03	Endangered species are covered in detail in the FEIS and the BO from the FWS (Appendix F to the FEIS).
A24-04	Discussion of impacts from turbidity and the other aspects of the project are covered in the Section 4 of the FEIS.
A24-05	No matter which method of beach nourishment is used, actual pumping or creation of offshore feeder berms, there must be a source of sand. Since the cost of transporting sand is directly proportional to pumping distance, the best way to keep cost down is to reduce pumping distance. Direct placement on the beach does this. It also ensures that all of the material will get to the beach, whereas offshore feeder berms do not deliver all of the material to the beach.
A24-06	We don't know what commercial development is being referenced but access to the beach will be provided both north and south of the seawall and north of the channel.
A24-07	If this is a reference to the Corpus Christi Ship Channel, any impact on the Corpus Christi Ship Channel from opening Packery Channel will be negligible.
A24-08	A cost benefit analysis was not performed for this project. A Value Engineering Study was conducted and identified \$4.75M construction cost-savings measures that will be implemented.
A24-09	A letter from Dr. van de Kreeke and our response are included as A02, above.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

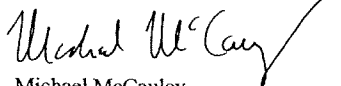
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Thank you for any support you can give this project.

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael McCauley", with a long, sweeping flourish extending from the end of the name.

Michael McCauley
P. O. Box 6926
Corpus Christi, TX 78411

A25-01

Comment

Response

A25-01

Thank you for your comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

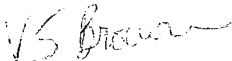
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Thank you for any support you can give this project.

Sincerely,



V. S. Brown
3641 Chestnut
Corpus Christi, TX 78411

A26-01

Comment

Response

A26-01

Thank you for your comments.

September 26, 2000

US ARMY CORP OF ENGINEERS
PUBLIC AFFAIRS DEPARTMENT
P.O. BOX 1229
GALVESTON, TX 77533

RE: Packery Channel Project--Corpus Christi, Texas

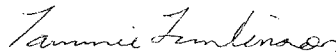
I, and my family, are IN SUPPORT OF THIS PROJECT..

We believe it is necessary for insuring the quality of the water in our estuaries, bays and canals on Padre Island as well as to protect the seawall in times of tropical storms.

Additionally, we believe this project will help the economic development of our area and help reduce unemployment by adding jobs as a result of new developments that would occur as a result of this project.

Thank you for any support you can give this project.

Sincerely,



Tammie Tumlinson
6701 Everhart Rd. Apt. 511
Corpus Christi, TX 78413

A27-01

Comment

Response

A27-01

Thank you for your comments.



RICHARD M. BORCHARD
NUECES COUNTY JUDGE

EXECUTIVE ASSISTANTS
 Steven G. Waterman
 Tyrer W. Little III

June 11, 2002

David Garcia, City Manager
 City of Corpus Christi
 P. O. Box 9277
 Corpus Christi, Texas 78411

Subject: *North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel).*

Dear Mr. Garcia:

On May 29, 2002 the Commissioners' Court authorized your permit to construct Phase I of *North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel)*. The construction must be underway within three years of the permit approval date or the permit becomes void.

Your permit is authorized with the following additions:

1. The proposed activity will not materially weaken dunes, or materially damage dune vegetation, or reduce the effectiveness of any dune to protect against erosion and high wind and water.
2. Authorizing a dune protection permit for Phase I of the North Padre Island Storm Damage Reduction and Environmental Restoration Project, between the line of vegetation on the east, 1,000 feet landward of the vegetation line on the west, the wooden bulkhead of the Padre Isles subdivision on the south, and a line 800 feet north of the wooden bulkhead, and including the associated dune mitigation sites south of Zahn Road that may be outside the area described in this authorization. The City is required to fully mitigate any damage to dunes within the area, in consultation with the Texas General Land Office.

We are pleased to work with the City of Corpus Christi in the development of this project.

Sincerely,

Richard M. Borchard
 Nueces County Judge

B1-01

Comment

Response

B1-01

Thank you for your comments.



County of Nueces

June 17, 2002

Mr. Rick T. Guerra, CFP
Frost Bank
Vice President / Private Banking
P. O. Box 749
4215 South Staples
Corpus Christi, Texas, 78403-0749

Dear Mr. Guerra,

I read in the Sunday, June 16, 2002 *Corpus Christi Caller-Times*, your comments in the "Political Pulse" under the heading "Neighborhood upset at dumpsite proposal".

To say the least, I was very disappointed to see your statement; "We feel like we've been hoodwinked," and that "the group is talking to an attorney."

My comments in the same article are consistent with past statements, over the last several months, I have made to you and others when asked about the use of Packery Channel Park for a dredge disposal site.

My answer was confirmed and is consistent with the answer you and the other interested folks received on April 18, 2002 at the Nueces County Beach Management Committee meeting concerning the dune permit requested by the City of Corpus Christi. In response to your question concerning the use of Packery Channel Park as a disposal site, City Staff told you that the site was not being considered.

As of this date I have not seen the DRAFT copy of the Corps of Engineers Environmental Impact Statement, however I have received some calls stating the site is listed in the document. If you will recall, as soon as I heard that the site was listed in the report, I telephoned you to assure you and your neighborhood folks that the listing must have been an oversight to be included in the study. Since this is a DRAFT, the Corps may not have taken time to delete it. I cannot answer for them.

— JOE McCOMB —

County Commissioner, Precinct Four • Corpus Christi, Texas 78401
County Courthouse • 901 Leopard, Room 303.11
Telephone: 361-888-0268 • Fax: 361-888-0470
P. O. Box 1689 • Corpus Christi, Texas 78403

B2-01

<u>Comment</u>	<u>Response</u>
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B2-01	Packery Channel Park will not be used for maintenance disposal (MMPA). A new location for the MMPA has been identified and is presented in the FEIS.
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Precinct Four

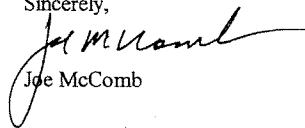
I trust that the intent and agenda of the neighborhood group and you is to protect the park from use as a disposal site. If that is your intent and agenda, it has been accomplished! May I suggest you save the funds you are planning to spend on an attorney, and contribute the money for improvements in the park.

Enclosed is a copy of a letter from Mr. Angel Escobar, Director of Engineering Services, confirming in writing what has been stated numerous times in the past. This should eliminate any doubt or concern you have.

I hope you will be in attendance at the public meeting scheduled for Thursday, July 18, 2002 at 7 P. M. in Room 225 - Selena Bayfront Auditorium. This will provide you an opportunity to thank the City of Corpus Christi and the Corps for addressing your concerns by eliminating Packery Channel Park as a disposal site and giving your full support to the project.

If you have any other questions or need additional information concerning this project please do not hesitate to call.

Sincerely,



Joe McComb

Encl: 1

Cc: Honorable Richard Borchard, Nueces County Judge
Honorable Loyd Neal, Mayor-City of Corpus Christi
Mr. David Garcia, City Manager-City of Corpus Christi
Mr. Angel Escobar, Director of Engineering Services-City of Corpus Christi
Mr. Tom Utter, Consultant-City of Corpus Christi
Mr. John Trice, Chair-Nueces County Park Board
Mr. Neal Falgoust-Corpus Christi Caller-Times

Guerra Packery Park



June 17, 2002

Commissioner Joe McComb
Nueces County Commissioner Precinct 4
901 Leopard Street
Corpus Christi, Texas 78401

Re: North Padre Island Storm Damage Reduction and Environmental Restoration
Project (Packery Channel)
Maintenance Materials Placement Area

Dear Commissioner McComb:

As you know, on Friday, June 14, 2002, the Corps of Engineers released the draft Environmental Impact Statement (EIS) for Packery Channel. Included in the EIS was the statement in Section 1.2.2.5 that referred to material not appropriate for beach placement will be placed in a confined upland disposal area encompassing approximately 7.5 acres of undeveloped property. This is property owned by Nueces County and located in Packery Channel Park.

At one time the City had been in contact with Nueces County on the possibility of using this location as a placement area for maintenance material. During the process for the Dune Protection Permit, approved by the Commissioners Court on May 29, 2002, adjoining property owners voiced their concern with using this location. The City wishes to inform the County that the use of Packery Channel Park is no longer under consideration and the location referred to in the draft EIS WILL NOT be used as a disposal site. The final EIS will reflect this change. The City is actively pursuing alternate sites with the Texas Department of Transportation and General Land Office.

The City wishes to thank you for the support Nueces County has shown on making this project a top priority and their help in assuring its successful completion.

Sincerely,

Angel R. Escobar, P.E.
Director of Engineering Services

Packery Channel/TIF Information Sheet

What is a Reinvestment Zone?

An area designated by a city within which certain public improvements are paid for by "tax increment financing," a method by which money to pay for the public improvements comes from growth (the "increment") of property values in the zone. This method is provided by the law of Texas and many other states. The theory is: construction of the public improvements will generate higher tax revenues due to additional private development; without the public improvements the increased tax revenues would not occur.

The Packery Reinvestment Zone is about 1,930 acres, located behind the Padre Island Seawall.

PROJECT SCOPE—PRIMARY ELEMENTS

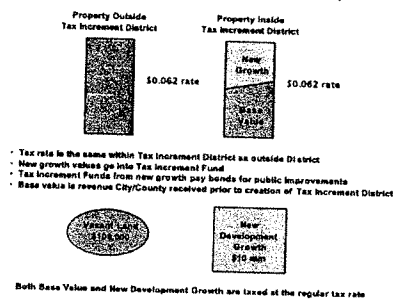
1. Permanently opening Packery Channel by dredging and constructing jetties, with the following preliminary dimensions:
 - 11 feet deep (7 feet deep west of Hwy 361 bridge)
 - Jetties 1,400 feet in length from the Gulf shore
2. Regular dredging to maintain the channel, with the dredged sand being deposited in front of the Padre Island Seawall to restore and maintain the presently eroding beach.
3. Park complex
 - North side channel park complex
 - parking for 200 cars
 - volleyball courts
 - protected kids play area and beach pavilion, with restrooms, showers, and concessions
 - South side beach park between south jetty and end of Padre Island Seawall
 - improved parking lot
 - pedestrian beach area
 - boardwalks providing access for wheelchairs and child strollers
 - elevated bathhouse and restrooms
 - shade pavilions for picnicking
4. 8-12 foot wide walkway atop jetties from the vicinity of the Highway 361 bridge to the end of the jetties, providing easy access to water, including for those with limited mobility, and providing public access for fishing and sightseeing.
5. The channel will provide more than 7,200 linear feet of fishing access without charge.
6. Beach access parking lot on top of seawall (local project)
7. Overall greater beach access

The final project scope will be determined by the United States Army Corps of Engineers.

Who will design and build the project? The U.S. Army Corps of Engineers. (Depending on the final Corps decision, some of the recreational features may be constructed by the City from the Tax Increment.)

What is the cost of the planned improvements? The preliminary estimated cost of the federal improvements is approximately \$30,000,000. The beach access parking lot on top of the seawall, a purely local project, would cost another \$750,000.

Tax Increment Financing Concept



Who will pay for the improvements? A \$19.5 million share is to be paid by the Federal Government. A \$10.5 million share is to be paid locally, through tax increment financing. The \$750,000 for the parking lot on the seawall will also be paid locally by tax increment financing.

Will bonds be sold to pay the estimated local share? Yes. What will be the period of time for paying the bonds? Twenty years or less.

Are revenues from the tax increment estimated to be sufficient to pay the bonds? Yes. Based on a report by Economics Research Associates, a national consulting firm specializing in recreational development forecasting, the tax increment generated will far exceed the amount needed to pay the bonds.

Who will buy the bonds? The developers of private lands adjacent to the Packery project. Thus, the developer takes any risk on the bonds. Because the developer will only be paid if private development increases taxes sufficiently to pay off the bonds, the private developer determines at the time it invests in the bonds that its project is economically viable.

What if the tax increment is insufficient to pay off the bonds, can the City (and taxpayers) be liable? No. State law provides: "Tax increment bonds and notes are payable, as to both principal and interest, solely from the tax increment fund established for the reinvestment zone." "A tax increment bond or note is not a general obligation of the municipality issuing the bond or note. A tax increment bond or note does not give rise to a charge against the general credit or taxing powers of the municipality and is not payable except as provided by this chapter. A tax increment bond or note issued under this chapter must state the restrictions of this subsection on its face." "A tax increment bond or note may not be included in any computation of the debt of the issuing municipality." In addition, the bond covenants will explicitly emphasize that bondholders have no recourse other than the tax increment.

If the bonds were not paid, would it hurt the City's credit rating? No. The City's financial advisors have advised the City that, because the bonds are expressly payable only from the tax increment, insufficiency of the tax increment would have no effect on other City obligations.

What is the Federal Government's role? The project was included in Section 556 of the Water Resources Development Act of 1999, passed by Congress. It requires the U.S. Army Corps of Engineers to determine if: (1) the project is environmentally acceptable, and (2) the project is technically sound, and provided preliminary reconnaissance funding of several hundred thousand dollars. For FY 2001, Congress appropriated \$1 million for review and design, which is being done now by the Corps.

Are the estimated costs final? No. Final costs will be determined by the Corps of Engineers study.

Who will determine if the project is technically sound? The U.S. Army Corps of Engineers. A 1999 study by Naismith Engineering for Nueces County concluded that the project was technically sound, as did a peer review of study commissioned by the Texas General Land Office. The Corps has concluded the project is technically sound. However, the project will also have to meet more stringent Corps standards and will only proceed after being found to meet these Corps standards.

Who will determine if the project is environmentally acceptable? The U.S. Army Corps of Engineers. The Naismith study concluded that the project is environmentally acceptable. Federal legislation requires the Corps of Engineers to determine if the project is environmentally acceptable. The Corps has determined that an Environmental Impact Statement is required. The project will only proceed if the Corps determines it to be environmentally acceptable, after conclusion of environmental studies.

Will the channel require continual maintenance? Yes. The General Land Office Peer Review noted that the project requires a commitment "to a comprehensive, flexible program of sand bypassing and maintenance dredging (i.e., sand management) and creating the appropriate financial mechanisms to fund it."

What will it cost to maintain the channel? The Naismith study estimated \$400,000 for annual dredging and other costs associated with the channel. The \$10.5 million estimated local share includes a \$4 million reserve fund. Long-term maintenance will be paid from earnings of the reserve fund. The Corps of Engineers study will determine if this amount is sufficient. The final project cost will include the amount concluded by the Corps of Engineers.

What entities are participating in the tax increment zone? The City of Corpus Christi, Nueces County, and the Nueces County Hospital District have agreed to contribute 100% of their tax increment in the zone. Del Mar College has agreed to contribute part of its tax increment. The Flour Bluff Independent School District and the Flour Bluff Fire District are not participating. Consequently, they will receive their full share of any increased tax revenues from new development.

What if tax increment revenues are more than needed to pay the bonds? Under State law, the zone terminates when the project costs and bonds have been paid. The bonds will contain provisions permitting early payment. Upon early payment, the zone can be terminated. After project costs and bonds have been paid, any money remaining in the tax increment fund is paid to the participating entities in proportion to their contribution.

Does the developer have to pay taxes on property he owns in the zone? Yes. The developer pays taxes like all other taxpayers, both inside and outside the zone. Like other zone taxpayers, the developer's taxes on increased valuations go into the tax increment fund.

Will the tax rate be higher for property in the zone than elsewhere in the City? No. The tax rate will be the same in the zone as in other areas of the City.

Will other taxpayers have to bear the burden of increased services in the zone? Developers must pay costs of constructing water and sewer lines, streets, and other infrastructure. Fire and police services, and maintenance and operation of streets, utilities, parks, code enforcement, and other routine city services will be provided in the zone as in other areas of the City. However, extra costs for these are anticipated to be exceeded by extra revenues generated within the zone, such as sales taxes, and extra revenues generated outside the zone due to development within the zone.



ENGINEERING GROUP

5656 South Staples, Suite 110 • Corpus Christi, Texas 78411 • Phone 361/992-2284 • Fax 361/992-2287

June 19, 2002

Department of The Army
Galveston District, Corps of Engineers
Attn: Environmental Section
P.O. Box 1229
Galveston, TX 77553-1229

RE: Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53)

Dear Mr. Saunders,

We would like to request an electronic (CD) copy of the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53) be sent to us at 5656 South Staples, Suite 110 Corpus Christi, TX 78411. If you have any questions, please feel free to call me at (361) 992-2284. Thank you for your time.

Sincerely,
Bath Engineering Corporation

Kristin Tilton
Administrative Assistant

B3-01

<u>Comment</u>	<u>Response</u>
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B3-01	No response necessary. Compact disk sent.
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WOOD, BOYKIN & WOLTER

A PROFESSIONAL CORPORATION
LAWYERS

RALPH R. WOOD (1901-1965)
MARSHALL BOYKIN III
ROBERT C. WOLTER*
STEWART N. RICE
JOHN D. BELL**
FREDERICK J. McCUTCHON§
PETER E. AVOTS
LUCINDA J. GARCIA-CASTILLO
ANNETTE L. CHEPEY

615 NORTH UPPER BROADWAY, SUITE 1100
CORPUS CHRISTI, TEXAS 78477-0397

TELEPHONE: 361/888-9201
FACSIMILE: 361/888-8353

*BOARD CERTIFIED-CIVIL TRIAL LAW
**BOARD CERTIFIED-COMMERCIAL
REAL ESTATE LAW
§BOARD CERTIFIED-LABOR & EMPLOYMENT LAW
TEXAS BOARD OF LEGAL SPECIALIZATION

July 16, 2002

Lloyd H. Saunders, Ph.D.
Galveston District, Corps Of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Re: Packery Channel Project in Corpus Christi, Texas

Dear Sirs:

I will not be able to attend your public hearing this Thursday in Corpus Christi due to a teaching commitment at Texas A & M University-Corpus Christi, but I wanted to provide input into your public comment process. The proposed project will have significant *positive* impact in many different respects.

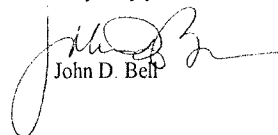
As to the environment, the project will improve circulation in the south end of Corpus Christi Bay and the Padre Isles area. While the Laguna Madre prospers as a hyper saline environment with limited circulation, the Packery Project will enhance water quality at the north end of the Laguna Madre and the south portion of Corpus Christi Bay where the development of the City of Corpus Christi urban area can have a possible negative impact.

As to public safety, the project will renourish the beach in front of the seawall on Padre Island helping to stabilize that structure and maintain critical storm surge protection for the residential development at the north end of Padre Island.

As to economics, the re-opening of Packery Channel and the stabilization of the public beach at the seawall will have a positive impact on local property values and development. It also will provide tremendous new recreation potential in this area.

In short, this is a "triple crown" project for the Corps of Engineers and I strongly support its implementation. Thank you for your consideration.

Very truly yours,


John D. Bell

<u>Comment</u>	<u>Response</u>
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B4-01	Thank you for your comments.
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Texas Transportation Institute
The Texas A&M University System
3135 TAMU
College Station, TX 77843-3135

979-845-5817
Fax: 979-862-2708
<http://tti.tamu.edu>

July 16, 2002

Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Dr. Saunders,

We would like to request an electronic copy of the Draft Environmental Restoration Project (PL 106-53). Please send this copy to the following address:

David Bierling
Center For Ports and Waterways
Multimodal Freight Transportation Program
Texas Transportation Institute
MS 3135 TAMU
College Station, TX 77843-3135

Thank you,

A handwritten signature in black ink, appearing to read "David H. Bierling".

David H. Bierling
Email: dhb@tamu.edu
Phone: (979) 862-2710

B5-01

<u>Comment</u>	<u>Response</u>
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B5-01	No response necessary. Compact disk sent.
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JOHNNY D. FRENCH

4417 Carlton Street
Corpus Christi, Texas
78415-5211
361-853-9331
jfranch@stx.rr.com

July 17, 2002

District Engineer
U.S. Army Engineer District, Galveston
P.O. Box 1229
Galveston, Texas
77553-1229

Dear Sir:

I have read the North Padre Island Storm Damage Reduction and Environmental Restoration Project, Nueces County, Texas, Draft Environmental Impact Statement (DEIS) and wish to make the following comments about it.

GENERAL COMMENTS

The DEIS is extremely deficient in its description of the existing environment and of project-induced impacts on southern Mustang Island. Readily obtainable information on human land use and the distribution of piping plovers north of Zahn Road on Mustang Island appears to have been left out of the DEIS intentionally. Documents that might explain this omission have been requested under separate cover. The proposed action also does not avoid impacts from dredging and filling to vegetated wetlands and piping plover critical habitat to the extent practicable.

SPECIFIC COMMENTS

Section 1.2.2.5, MMPA, P. 1-12 -- The DEIS states that dredged material from the maintenance of the channel will be placed on City of Corpus Christi property south of Packery Channel and northwest of SH 361. It is now understood that for various reasons this proposed location might not be available for the MMPA. The DEIS should describe these availability problems and propose alternative sites for the MMPA.

Section 1.2.6, Recreational Development, p. 1-13 -- The DEIS states the City of Corpus Christi has proposed recreational facilities in Reach 1 that would include parking lots, access roads, a pavilion, and a boat ramp. Figure 4.11-1a (p.4-61) also shows an Admin/Maintenance building, and appears to indicate all of these specific facilities would be built north of the channel. These facilities would constitute induced developments north of the proposed channel, and as such would encroach upon the Mollie Beattie Habitat Community and the piping plover Critical Habitat with additional noise, waste oils and fuels, trash, and increased human activity. The project should be redesigned to minimize these adverse impacts by moving as much of these facilities as possible to the south side of the channel. Furthermore, the proposed boat ramp in Reach 1 should be eliminated because it would create congestion near a high current velocity zone caused by the channel bottleneck beneath the SH 361 bridge, and, due to the limited sight

B6-01

B6-02

<u>Comment</u>	<u>Response</u>
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B6-01	An alternative site has been selected, in consultation with appropriate State and Federal resource agencies, and a 50-year lease has been granted by the Port of Harlingen Authority. Complete details are in Section 1.2 of the FEIS.
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B6-02	<p>These facilities, although described in the FEIS, are not part of the Federal Project and are not under the control of the USACE. Additionally, these facilities, except the Administrative /Maintenance Building are on the PA2 footprint and will not impact additional habitat. The Administration Building is necessary, in part because of the City's obligation to enforce the No-Wake Zone. The MBHC is west of SH361 and as such, includes part of Reach 2 but none of Reach 1. Critical Habitat Unit TX-6 is entirely north of the proposed recreational facilities. Additionally, any construction will require permits that will entail scrutiny by all pertinent resource agencies. With implementation and enforcement of the No-Wake Zone, there should be no navigational hazard near the boat ramp in the Inner Basin.</p>
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distance created by the bridge, constitute a navigational hazard to vessels approaching Reach 1 from the west.

The DEIS also mentions that the City has proposed additional boat ramps, parking facilities, and restrooms in the vicinity of Causeway Area Access Point and Packery Point Park. These facilities should be constructed as far as possible to the west in Reach 2 so as to minimize impacts to the Mollie Beattie Habitat Community.

Section 3.4.5, Coastal Shore Areas/Beaches/Sand Dunes (including Channel Fill Sands) -
- The DEIS states the littoral drift along Mustang Island is from north to south. While the net sediment transport may be from north to south, the direction of littoral drift is seasonally variable, depending upon prevailing winds, and is probably northward most of the year.

Section 3.6.2.2, Birds, p. 3-56 -- The DEIS' discussion of the piping plover is seriously flawed by the lack of reference to key survey data associated with the Corps permits for reopening Packery Channel and The Village. Even more significantly, there is no reference to the Biological Opinion (BO) written about the reopening permit for the Corps by the Fish and Wildlife Service (FWS). Worst of all, none of these three documents is referenced in the Biological Assessment (BA) attached to the DEIS as Appendix C. Failure to cite and use these references, all of which are in the Corps' files, does not comply with mandatory Endangered Species Act (ESA) consultation requirements that the Corps use the best scientific information available, and is also a violation of the National Environmental Policy Act (NEPA) Guidelines.

Section 3.11.3.1, Existing Land Use, p.3-105, and Figure 3.11-2, p 3-107 -- The DEIS states: "In this section, land use is described for that portion of the study area that is located on North Padre Island most relevant to the proposed Project (Figure 3.11-2). The study area for this section addressing land use is defined as the area of North Padre Island that is located within the City of Corpus Christi city limits, and is bounded by Packery Channel (west of SH 361) and Zahn Road (east of SH 361) to the north and by the Nueces-Kleberg County boundary to the south." It should be noted, first of all, that the geographic division between North Padre Island and Mustang Island in the project area runs almost north to south through the middle of present-day Lake Padre, and not roughly east to west along the proposed alignment of the channel in Reach 1 of the project. The majority of the project's direct construction impacts, as well as the area of greatest concern for induced impacts to the piping plover's Critical Habitat, being on southern Mustang Island, the DEIS' restriction of its study of existing land use to North Padre Island is inexcusable. Among the salient land use features excluded from Figure 3.11-2 and this section are the Mollie Beattie Habitat Community, J.P. Luby Surf Park, Mustang Island State Park, the piping plover Critical Habitat, petroleum developments, and county and private properties between Zahn Road and the state park. The figure and this section should be expanded northward to include these features in the study area, and the scope of the DEIS sections which discuss project direct, cumulative and indirect impacts, especially induced impacts, should be expanded accordingly.

Section 4.4, COASTAL COMMUNITY TYPES, pp. 4-25, et seq. -- Table 4.4-1 on p. 4-26 indicates that a total of 2.3 acres of submerged aquatic vegetation (SAV), 0.2 acre of low salt marsh, and 7.2 acres of high salt marsh would be destroyed by the placement of dredged material in proposed Placement Areas 2 and 3. On p. 4-28, the section states that in Reach 1 the proposed shoreline improvements and dredging of the Inner basin would also remove SAV beds. On p. 4-31 it states that "construction activities associated with the various proposed recreational development (e.g., parking areas, access roads, and boat ramps)" would impact coastal wetlands. On p.4.32, it states a total of 11.1 acres of low and high marsh communities would be negatively impacted by dredging and maintenance material placement. Much, if not all, of the proposed impact to vegetated special aquatic

B6-03

B6-04

B6-05

B6-06

<u>Comment</u>	<u>Response</u>
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B6-03	The City has no specific designs for the Packery Point Park, located on City property on the west side of the Channel across from the MBHC, but proposes additional facilities during a second phase. The City and the GLO have entered into a Memorandum of Understanding to address concerns that the project might have some negative impacts on the MBHC. The City and the GLO have agreed to establish a task force to address issues related to impacts to MBHC. The City will undertake a monitoring program (Appendix A); conduct mitigation, if determined necessary by the GLO and task force; and resolve and significant negative impacts caused by the project.
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B6-04	This correction will be included in the FEIS.
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B6-05	The results of these important references have been added to the FEIS and the Revised BA, which was supplied to the FWS in January 2003.
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B6-06	It is technically correct that the "geographic division between North Padre Island and Mustang Island in the project area runs almost north to south through the middle of present-day Lake Padre, and not roughly east to west along the proposed alignment of the channel in Reach 1 of the project", based on the historical and geological configuration of the North Padre Island and Mustang Island shorelines. However, the present day shoreline configuration has made the division between the two islands rather ambiguous. Present day City maps do not delineate the boundaries between the two islands based on their historical boundaries, and residents of the City of Corpus Christi commonly refer to all areas within the study area as North Padre Island. This comment has been noted, but no revisions will be made to the document. The Mollie Beattie Habitat Community boundary is now shown on Figure 3.11-2, and the Piping Plover Critical Habitat Units are now shown in Figure 3.6-1. The City of Corpus Christi and Nueces County Parks and Recreation were contacted for the boundaries of the J.P. Luby Surf Park, but City and County staff were not aware of the boundaries. The Mustang Island State Park, petroleum developments, county and private properties between Zahn Road and the Mustang Island State Park are north of the study area boundary and are not shown. It was judged that the majority of the land use impacts associated with the proposed project would not occur north of the study area boundary because very little of the land directly north of the study area is developable. The land directly north of the study area is mostly public land, and master plans submitted to the City of Corpus Christi (for the Lake Padre development) call for private development mainly in the Lake Padre area south of the proposed Packery Channel. Consultation Number 2-11-92-F-024 (dated August 1, 1994), provided by the USFWS – Ecological Services, Corpus Christi to the USACE, Galveston District, on page 19, states that "Having the channel open would be a major inducement for water-related developments, but the Service envisions very little potential for
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such development occurring outside the already heavily-impacted North Padre Island area.” Because land use effects (either direct or secondary) are unlikely to be significant north of the study area, the Land Use Figure (Figure 3.11-2) and discussion of existing land use in section 3.11.3.1 is appropriately focused on the study area as it has been defined in this section.

sites is presumably avoidable. The DEIS should delineate the specific locations of these impacts and, unless the Corps can clearly demonstrate there are no less damaging alternatives to the losses of vegetation, relocate the project features responsible (placement areas, parking lots, bulkheads, and channel/basin edges) so as to preserve SAV and marsh habitat to the extent practicable.

B6-07

Section 4.4.4, Coastal Shore Areas/Beaches/Sand Dunes (including Channel Fill Sands), p. 4-33 -- This section states that, based on preliminary location footprints of parking lots, access roads, and buildings, secondary development by the City of Corpus Christi may potentially impact 3.4 acres of primary/secondary dune complexes, 3.7 acres of beach, and 0.3 acres of tidal flats. The DEIS should identify the specific locations of these impacts and discuss less damaging alternative locations for the parking lots, roads and buildings.

B6-08

Section 4.5.1.3, Essential Fish Habitat, p.4-41 -- The section states the project as proposed would bury 11.1 acres of estuarine marshes when the channel is dredged and the bulkheads are backfilled. In accordance with the 404(b)(1) Guidelines and other current state and federal agency guidelines, an individual permit applicant making a similar proposal would be asked to move the dredging, bulkhead, and fill away from the vegetated shoreline or clearly demonstrate there was no less damaging alternative. The DEIS should treat the proposed action similarly.

B6-09

Section 4.5.2, Wildlife Resources, p.4-42 -- The Section should discuss the secondary impacts on wildlife resources of induced development north of the project area. Also, although the section states the closest seabird rookery or colony is 4000 feet south of Packery Channel and east of Park Road 22, and that all others are at least 2 miles from Packery Channel, there is another rookery on DMPA 174, also known as Rawalt Island, on the north side of Packery Channel and northeast of its junction with the GIWW. Not used as a disposal area since the GIWW's construction, Rawalt Island has numerous small trees and brushy vegetation favored by roosting herons and egrets, and the exposed mudflats on its southern and western sides are heavily-used seasonal loafing areas for white pelicans. The shallow submerged flats and SUV between Rawalt Island and the GIWW are also significant because they were the subject of a major restoration project after the grounding of a barge there several years ago.

B6-10

Section 4.6.2, Wildlife, pp. 4-43, et seq. -- The section begins by stating that, with or without the proposed project, potential commercial and residential development occurring in the project area could have an impact on brown pelicans, other seabirds, and sea turtles. The DEIS should identify where development with potential to impact these species is expected to occur and attempt to quantify the impact, particularly if the project has the potential to induce this development and/or accelerate its growth in areas north of Packery Channel.

B6-11

On p. 4-44, the section cites surveys done for piping and snowy plovers in association with Corps-permitted activities for Commodore Cove II and Packery Channel Marina, but it neglects to mention more intensive surveys done for permits issued for The Village and for the reopening of Packery Channel. The section also neglects to mention piping plover sightings reported by the FWS that resulted in the halting and subsequent realignment of containment levee construction by a Corps contractor on GIWW DMPA 172 less than half a mile south of the GIWW-Packery Channel junction. The latter incident became the cause for the contractor's lawsuit for lost wages, and the subject ultimately of his appeal to the Supreme Court of the United States (*certiorari* denied). This neglected information should be included in the DEIS' consideration of the existing environment, project impacts, and cumulative impacts, as well as in the BA in Appendix C.

B6-12

<u>Comment</u>	<u>Response</u>
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- | | |
|-------|---|
| B6-07 | The channel alignment and PAs were deliberately selected and adjusted to minimize impacts to coastal vegetation. The areas of impact can be easily seen on Figures 3.4a-e and occur where the project footprint overlaps the vegetation communities. |
| B6-08 | The parking lots sit, to the extent practicable, on other portions of the project footprint to reduce additional impacts. There will be mitigation for the dune complex, as identified in the City's GLO Dune Protection Permit in Appendix C of the FEIS |
| B6-09 | As noted above, the channel alignment was adjusted to avoid vegetation impacts, to the extent practicable. Mitigation for all seagrass impacts is included in the City's GLO permit, at a 3:1 ratio. |
| B6-10 | Please see response to Comment C7-06 relative to induced development north of Packery Channel. The rookery on PA 174 will be noted in the FEIS. |
| B6-11 | While development along the coast generally can have an impact on coastal fauna, specific locations, where the development and, thus, the impacts might occur, cannot be more tightly defined than it is in the FEIS. |
| B6-12 | The surveys noted have been included in the FEIS and in the Revised BA. The DEIS did not specifically discuss PA 172, except as part of the 2000-2001 piping plover survey, any more than it did other areas of comparable distance from Packery Channel where no impacts are expected. |

At the top of p. 4-45, the section refers to a November 26, 1997 letter from the Director of the FWS to Senators Gramm and Hutchison and Congressman Ortiz acknowledging that, "in consultation regarding a previous permit action for Packery Channel, [it was] determined that the reopening of Packery Channel is unlikely to jeopardize the continued existence of the piping plover." As noted previously, the BO resulting from that consultation itself is not mentioned by name in the text of the DEIS nor in the BA at Appendix C. However, the November 26, 1997 letter, which is attached to the DEIS at the beginning of Appendix D, indicates that the consultation over the permit included consideration of the FWS' concerns that the reopening could accelerate secondary development on the barrier island. Having written the original drafts of both the November 26 letter and the BO to which it refers, I can assure you that the chief concern was that the reopening not induce significant secondary development north of Zahn Road, because I personally saw piping plovers along the gulf beach from there to the bollards at the southern boundary of Mustang Island State Park, and they were consistently sighted there during the survey conducted by Paul Carangelo for the permittees. These sightings are within the proposed boundaries of PA 4N, as well as the Critical Habitat of the piping plover.

B6-13

The section admits that the proposed action would cause the permanent loss of 6.2 acres the Critical Habitat in Units TX-6 and TX-7, and "occasionally" impact an additional 24.6 acres of beach in TX-7 due to the placement of maintenance material. The section attempts to disparage the importance of these proposed adverse modifications of the Critical Habitat by citing the abundance of algal flats and sand flats in the adjacent Critical Habitat areas, and the heavy recreational and vehicular use of the beach areas in the project portion of TX-7. It even goes so far as to argue that because of existing heavy public use and development, the project area does not possess the constituent elements for other than marginal piping plover use. Aside from this DEIS not being the proper forum for a discussion of the merits of the beach's Critical Habitat designation, the section misses two significant points. The first is that, had its preparers considered the BO and Mr. Carangelo's survey information, they would know that despite the human intrusion that specific beach nonetheless plays an important role as the local piping plover population's foraging and roosting habitat whenever winds and tides preclude these activities on the flats in the washover pass complex and on the west side of the barrier island. The beach is, in fact, that population's refugium during winter storm events. The second overlooked point is that the proposed project's impacts and those caused by the existing level of human use must be viewed cumulatively. The DEIS should seek alternatives to reduce the potential not only for the project to affect the Critical Habitat directly and indirectly, but also to avoid serious cumulative impacts to that same Critical Habitat. I recommend the elimination of as much initial and secondary development as possible from the area north of Zahn Road. The DEIS should address an alternative which would close the beach and adjacent washover areas to access to vehicles between Zahn Road and Mustang Island State Park.

B6-14

The section states on p. 4-45 that "Since all dredging of the proposed Packery Channel will be performed by cutterhead dredges, or hopper dredges with turtle-deflecting dragheads, screens, and turtle observers, no impacts to sea turtles are anticipated from dredging." This section should be expanded to relate the circumstances of the 5 sea turtle mortalities occurring this spring during a single 24-hour period during maintenance dredging at the entrance channels to Port Mansfield and the Port of Brownsville. In light of these events, you may want to reword the section's quoted passage. The DEIS also is silent on the issue of the impacts of the proposed use of the sand-bypass system on sea turtles. The DEIS should discuss the use of this system in more detail, and include any reports of its effects on sea turtles elsewhere.

B6-15

Section 4.11.2, Tax Increment Finance District, p. 4-57 — The section states the City of Corpus Christi plans to pay for its approximately \$11.3 million cost share for the

<u>Comment</u>	<u>Response</u>
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| B6-13 | Reference to the 1993 BO and the piping plover surveys noted in it have been added to the FEIS and the Revised BA. The quote from the BO is correct and as noted in the response to C7-06, the BO, while discussing the concerns mentioned here also noted that development to the north was considered unlikely. The acreage on PA4N is included in the impacts to Critical Habitat Unit TX-7 in the DEIS and the FEIS. However, should PA4N be used, impacts to the beach would be temporary and would replace erosion occurring there, thus aiding the continued existence of that portion of TX-7. |
| B6-14 | The USACE concurs with the author's assessment of the "marginal use" sentence and it has been deleted. Reference to the 1993 BO and the piping plover surveys noted in it have been added to the EIS and the BA. However, Mr. Carangelo's survey was discussed in Shiner, Moseley and Associates (1994), which was included in the DEIS, and, therefore, was not completely excluded from the DEIS. An examination of the figures from Mr. Carangelo's and other surveys indicate that piping plovers were found on the beach area included in PA4N, and thus were included in the acreage of impacts to TX-7. However, none were found where the permanent loss will occur from channel and jetty construction. Therefore, we conclude, as did the 1993 BO for essentially the same project, that the project will not threaten the continued existence of the piping plover. |
| B6-15 | Hopper dredges will not be used for this project. With that change, the statement is true. |

proposed reopening project through use of TIF revenues, as well as for the costs of its proposed associated recreational development. The section should include the cost estimate for this recreational development.

B6-16

Section 4.13, ANY IRREVERSABLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES INVOLVED IN THE IMPLEMENTATION OF THE RECOMMENDED PLAN, p.4-70 -- The section states: "Loss of piping plover critical habitat is offset by creation and regular nourishment of enlarged beach habitat north and south of the jetties in PAs 4S and 4N." The section offers no proof that the PAs would be used by the piping plovers after dredged material placement, much less during that placement, nor that the species would tolerate the cumulative effects of that placement and of the other existing and anticipated human uses of the beaches. I recommend the statement be given support for its claim or replaced with an admission that the future use of the sites of PAs by the piping plover is in serious doubt. See comments above about removing all project features and secondary developments from the area north of Zahn Road and closing the beaches and washover areas to vehicular access between there and the southern border of Mustang Island State Park.

B6-17

Section 5.1.1, Assessment Methodology, p.5-1 -- The section on cumulative impacts fails to include the maintenance of the GIWW, Padre Isles Development, and Lake Padre among the list of existing and reasonably foreseeable future actions.

B6-18

Section 5.4.3, Cultural/Socioeconomic Resources, p.5-17 -- The section states secondary developments would occur with new channel development and maintenance of existing channels, due in part to the increased transportation and safety aspects of the reviewed projects, and that increased development of both North Padre and Mustang Islands is anticipated as a result of improved access due to the improvements to the JFK Causeway, but that the proposed Packery Channel Project would increase tourist and recreational usage and commercial and residential development only on North Padre Island. This begs the question: why would the proposed project, which also includes creation of new recreational facilities, new access roads, development of a new channel, and maintenance of an existing channel within and adjacent to southern Mustang Island, not also induce secondary development on Mustang Island? The DEIS should be rewritten to address the potential for inducing such secondary development on Mustang Island, and then to treat the effects of such development as the NEPA and ESA require.

B6-19

Section 9.4, PUBLIC VIEWS AND RESPONSES, p.9-2 -- This section summarizes the concerns expressed by the public at the September 7, 2000 scoping meeting. As the section correctly states, these included "increased development on the islands" (emphasis added). The public wanted the DEIS to address the potential for and the effects of increased development on both Mustang and North Padre Islands. The DEIS has improperly narrowed its scope to but one island, and must now be revised to include the other.

B6-20

Appendix C, BA, Section 2.0, IMPACT ASSESSMENT FOR LISTED SPECIES, p C-11 -- The BA has determined that the proposed project would destroy 6.2 acres of the piping plover's Critical Habitat and adversely modify another 24.6 acres, yet has not called for formal consultation as required by section 7(a)(2) of the ESA. It furthermore dismisses these losses as minor because there would be similar habitat remaining and the Critical Habitat affected already has heavy recreational and vehicular use, and concludes these losses would therefore not jeopardize the species' existence. However, as noted above, the BA does not take into account piping plover surveys pertinent to the project site, refer to the BO already written for an almost identical permitted project, nor consider the cumulative effects of existing activities and induced development in the remainder of the adjacent Critical Habitat. In short, the BA is deficient in factual basis and cannot support its conclusions regarding the scopes of the project's impact to this species and to its

B6-21

<u>Comment</u>	<u>Response</u>
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| B6-16 | While the Recreational Development is noted in the FEIS, since much of it is on the footprint of the Federal project, it is not part of the Federal project and will proceed only with separate permits. Impacts and benefits of the Recreational Development are, therefore, not included in the FEIS. |
| B6-17 | We do not understand this comment. Beach nourishment is normally requested and lauded. It was given serious consideration for North Padre Island beaches for maintenance material from the GIWW through the Laguna Madre by an Interagency Coordination Team that included numerous State and Federal resource agencies. Concern that piping plovers might not use the nourished beaches was never expressed. Here, however, where there is a portion of Critical Habitat Unit TX-7 that is rapidly eroding, this concern is raised. The USACE is not aware of any studies, nor were any put forth during the preparation of the DEIS or the comment period on the DEIS, which indicates that nourished beaches do not recover the prey species used by piping plovers or other shore birds. The DEIS clearly states that Critical Habitat in the channel cut and under the jetties would be permanently lost but that the acreage in PAs 4N and 4S would be only temporarily impacted by the nourishment, versus the possibility of permanent loss from erosion. While there was no Critical Habitat in 1993, there was a great deal of discussion about piping plovers in the 1993 BO, but this concern was not expressed. |
| B6-18 | The GIWW rarely requires maintaining near the JFK Causeway and the two PAs nearest Packery Channel, PAs 174 and 175 have never been used. Maintenance dredging has been removed from the permit for Packery Channel, and the Padre Isles impacts and mitigation were included in "other permitted activities" in the Cumulative Impacts Section. |
| B6-19 | Please see the response to C7-06. |
| B6-20 | Please see the response to C7-06. |
| B6-21 | Formal Consultation has been initiated and a BO has been prepared by the FWS and is appended to the FEIS. |

Critical Habitat. The BA should be expanded to address the deficiencies and to provide support for its conclusions regarding this species.

Appendix C, BA, Section 2.4.6, Effects of the Project, p.C-17 -- This section, which addresses project effects to the Kemp's ridley sea turtle, anticipates no impacts to the species from the proposed dredging of Packery Channel. It further states that lighting and traffic from developments associated with the project could impact its nesting activities, should they occur in the vicinity, and that its potential nesting habitat could be removed by the proposed dredging. However, the section concludes that although occasional individuals may be negatively impacted by this project, the continued existence of this species is not likely to be jeopardized, nor is take, as defined under Section 9 of the ESA, anticipated. The FWS has interpreted Section 9's definition of take to include actions which interfere with a listed species' reproduction, so the section's statement regarding take is mistaken. As for not anticipating that the dredging would impact the turtle, see comments above on Section 4.6.2. Similar comments can be made about how the BA dismisses impacts to other sea turtle species. Likewise, the BA does not consider effects of the sand-bypass system on all species of sea turtles.

B6-22

Appendix C, BA, Presence in the Project Area, p. C-34 -- This section of the BA omits pertinent piping plover survey data, as noted above.

B6-23

Appendix C, BA, Presence in the Project Area, p. C-46 -- This section of the BA omits well-documented reports of a recent manatee sighting in the intake canal of the Barney Davis Power Plant, approximately 8 miles southwest of Packery Channel.

B6-24

CONCLUSION

The DEIS has major blind spots in its handling of development on southern Mustang Island, impacts to endangered species, and impacts to special aquatic sites. These are issues usually handled routinely and skillfully when similar dredging and filling activities are assessed by the professionals working for the Corps, leading one to suspect the initial fruits of their labors have been subject to tampering. With proper attention to the areas of concern described above, I believe the project and the DEIS can be modified to eliminate most of the avoidable problems with both.

Sincerely,



Johnny D. French

<u>Comment</u>	<u>Response</u>
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B6-22	Please see response to C7-21.
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B6-23	The BA has been rewritten to include this important information and the Revised BA was submitted to the FWS.
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B6-24	The Revised BA included this information.
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July 17, 2002

U.S. Army Corps of Engineers
Galveston District
P.O. Box 1229
Galveston, Texas 77553-1229

Attn: Lloyd H. Saunders, Ph.D.

Re: Comments on Draft Environmental Impact Statement

Dear Mr. Saunders:

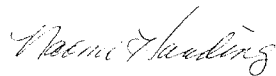
On behalf of the Padre Island Business Association, we would like to thank the Corps of Engineers for the opportunity to review the Draft Environmental Impact Statement (DEIS) for North Padre Island Storm Damage reduction and Environmental Restoration Project and provide public comment.

The Padre Island Business Association has actively followed the progression of this project for many years and looks forward to seeing the project brought to fruition. We were particularly pleased to see in the DEIS that no significant environmental findings were found.

Area planners, engineers and environmental scientists have watched diligently over the years to adequately plan this project so that impacts to the environment would be minimized. It is our strong belief from review of previous studies as well as the DEIS that there will be a net benefit to the environment once construction activities are complete and the project is operational.

We encourage the Corps of Engineers and our local area project sponsor to proceed expeditiously with this project and once again appreciate very much the opportunity to comment on such an important public project.

Sincerely,



Naomi (Corky) Harding
13962 Windjammer
Corpus Christi, TX 78418

B7-01

<u>Comment</u>	<u>Response</u>
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B7-01	Thank you for your comment
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Gregory Boss
14328 Playa del Rey
Corpus Christi, Texas 78418

(361) 949-8673
(866) 800-9355

July 17, 2002

RE: Support for opening Packery Channel, Padre Island, Texas


L.Loyd H. Saunders, Ph.D.
Galveston District, Corps Of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Sir,

I wish to voice my support for the opening of Packery Channel if executed in a safe and effective way utilizing good engineering practices.

I have had property with riparian rights fronting the channel since 1969 and have lived on that property off and on since 1971.

Thank you for your consideration.

Sincerely,

Greg Boss

B8-01

<u>Comment</u>	<u>Response</u>
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B8-01	Thank you for your comments.
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DEIS SOCIOECONOMIC RESOURCES DOCUMENTATION

This is about documentation and conclusions in the Socioeconomic Resources section, 4.11.

Even an amateur like me can spot inflated claims and juggling with figures. An example: Table 4.11-1, PROJECTED POPULATION EFFECTS, NUECES COUNTY, TEXAS...It shows that with the Proposed Project, the population is projected to increase from years 2003 – 2023 by 96,892 whereas with the No-Action Alternate would increase by 91,707. The difference over 20 years is 5,185, or 1.19 percent over the 442,045 projected by the Texas Water Development Board. This is negligible.

B9-01

Stated right under the table is this sentence: "Most of the increase in population (over No-Action population estimates) would be concentrated on North Padre Island near the proposed Project area." This is all extrapolated guesswork. The difference in the two projections is insignificant. The statement is full of air. It's just a claim, which leads one to suspect the objectivity of the study.

B9-02

One more example: Table 4.11-3: ADDITIONAL ANNUAL PERSON-DAYS TO NORTH PADRE ISLAND WITH PROPOSED PROJECT. It claims to show that the Project would add 1,073,972 "person-days" more to the 15,573,943 person-days extrapolated to 2023 for the No Action Alternate. They say that this would represent a 6.9 percent increase due to the Project.

But 859,651 of the additional 1,0073,972 "person-days" turns out to be a new category of "overnight visitors" not mentioned in the No Alternate total.

B9-03

At the top of page 4-55 the DEIS states: Recreation and tourism impacts were developed by projecting visitor day rates discussed in the HSGA report; and using population projections for the state provided by the TWDB.

Is it not true that the HSGA report was paid for by the proponents of this project? Has a qualified neutral entity been engaged to evaluate the original study?

B9-04

Frank Hankins 721 Crestview Drive. Corpus Christi, TX 78412 361-991-4637



<u>Comment</u>	<u>Response</u>
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- | | |
|--------|---|
| B9-01 | Table 4.11-1 simply reports the projected increase in population, due to the proposed project and secondary private development, that was reported by the HSGA report and compares this increase against TWDB projections for the baseline conditions for Nueces County. The reason that the percentage difference over the no-action alternative is only 1.19 percent is because the increase in population is being compared to baseline projections for the entire county. The TWDB does not provide population projections (for comparison purposes) at the census tract level, so this type of comparison was not possible. |
| B9-02: | Section 4.11.1 correctly states, "Most of this increase in population (over No-Action population estimates) would be concentrated on North Padre Island near the proposed Project area." This is not guesswork, but is based on research, observations made during a land use survey of the area, a review of the HSGA report and other studies, and discussions with the City of Corpus Christi City Manager and other City staff regarding land development trends in the area. Section 4.11.4.3 (Private Development) provides a detailed explanation regarding where private development would occur and why. Population would grow in the area where this secondary private development would occur. |
| B9-03: | The over-night visitors provided in Table 4.11-3 and discussed in section 4.11-3 are a subset of the total annual person-days that are discussed in section 3.11.2.2. This material came from the HSGA report, where a slightly greater level of detail was provided for the impacts than for the baseline. In the HSGA report, over-night visitors were identified separately as a group in order to identify the average expenditures that would be related to over-night visitors, as opposed to day-visitors and other groups. |
| B9-04 | Most people are paid for their work. That does not necessarily detract from either the value or the objectivity of that work. The HSGA report as well as other data and documentation were utilized for the FEIS analysis. |



Department of Engineering Services

July 18, 2002

Colonel Leonard D. Waterworth
District Engineer
Department of the Army, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Subject: Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53).

Dear Colonel Waterworth:

The Port of Corpus Christi Authority staff has the following comments on the subject herein referred to as the "Packery" project.

Page 5-6 paragraph at top. Please correct the sentence as shown here by ~~strikeout~~, "The proposed route would ~~become the designated hazardous materials route and would also~~ provide an alternative for general traffic, including hurricane evacuation traffic from areas east of Corpus Christi bay, independent of the Harbor Bridge and the Lift Bridge (Shiner, Moseley and Associates ~~et al~~ 2001)".

Page 10 --14. Also, correct the Bibliography as provided below to replace for the above-corrected citation.

"Shiner, Moseley and Associates, Inc. 2001. Environmental assessment for the proposed Joe Fulton International Trade Corridor from IH 37 to US 181, Nueces County, Texas. July."

Pages 4-71, 4-75, 4-76 and 4-77. The PCCA supports using pre-qualified portions of the proposed Corpus Christi Ship Channel Channel Improvement Project (CCSCCIP) beneficial use sites as mitigation sites for other regional economic development projects. We believe that is a smart solution to several resource management problems associated with mitigation including, but not limited to, mitigation site availability, and would integrate habitat impacts and impact compensation with estuarine habitat needs. Nonetheless, the PCCA is the owner of the property upon which mitigation by others, like that described in the Packery DEIS, could be conducted. Consequently, the PCCA will need to be contacted by any applicant, permittee, owner, or project sponsor that proposes to use PCCA land and a lease and/or easement agreement obtained from the PCCA.

Section 4.15.5. The mitigative procedures and condition provided in the Packery DEIS appear to be those coordinated for the CCSCCIP with the CCSCCIP Mitigation and Regulatory Agency Coordination Team Workgroups. As such they are not directly applicable to the Packery project since the non-federal sponsor referenced in the Packery procedures would be the City of Corpus Christi but the non-federal sponsor for the CCSCCIP navigation project is the Port of Corpus Christi Authority. In context of the mitigative procedures and conditions for the Packery project and the

B10-01

B10-02

B10-03

B10-04

Website: www.portofcorpuschristi.com

222 Power Street Corpus Christi, TX 78401 • P.O. Box 1541 Corpus Christi, TX 78403 • TEL: 361-882-5633 • FAX: 361-881-5163

<u>Comment</u>	<u>Response</u>
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B10-01	The correction has been made.
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B10-02	The correction has been made.
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B10-03	The approved mitigation plan now includes enhancement of Shamrock Island, rather than the BU sites for the CCSCCIP.
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B10-04	The mitigation for this project has completely changed (see FEIS Section 4.15)
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Colonel Leonard D. Waterworth
July 18, 2002
page 2

potential use of PCCA land for mitigation, the PCCA must be included in this section as an additional named party for all referenced consultation, coordination, surveys and reporting.

Also, since CCSCCIP is currently in the feasibility study phase and subject to authorization in the Water Resources Development Act of 2002, I suggest that the Packery project identify the proposed CCSCCIP beneficial use sites as possible mitigation site options that could be available during construction.

Thank you for the opportunity to comment on the Packery DEIS.

Sincerely,



Paul D. Carangelo REM, CESM, PWS

Cc: John LaRue
Frank Brogan
Greg Brubeck
David Krams
Lloyd Saunders, USACE Galveston

B10-05

Comment

Response

B10-05

Please see response to B10-04.

Ronald T. Ruiter
Kathleen M. Ruiter
13914 Primavera Drive
Corpus Christi TX 78418

July 18, 2002

Dr. Lloyd H. Saunders, Ph.D.
Galveston District, Corps Of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

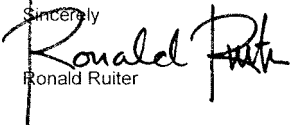
Re: Packery Channel Project
Public Hearing

Dear Dr. Saunders

I am unable to attend the public hearing this evening concerning the proposed Packery Channel Project environmental impact so I am writing to register my support for the project. As a resident of Padre Island I believe that the potential benefits of opening the Packery Channel will positively and significantly affect the environmental, public safety and economic aspects of life on The Island.

Your consideration of my support is appreciated.

Sincerely


Ronald Ruiter

B11-01

Comment

Response

B11-01

Thank you for your comment

July 18, 2002

Mr. Lloyd H. Saunders, Ph.D.
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Re: Packery Channel

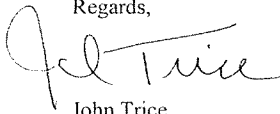
Dear Mr. Saunders:

As a resident of Padre Island since 1978, and a lifelong resident of Corpus Christi, I would like to voice my support of the reopening of Packery Channel. Reopening Packery Channel would be good for the environment, an ongoing source of fill material to protect the Padre Island seawall, and a great recreational structure. It is my hope that reopening Packery Channel will enhance the fish population and the development of other marine life. Please give every consideration to reopening Packery Channel.

I appreciate the opportunity to comment on this public project. Please make my comments apart of the public record.

Thank you so much for all the Army Corps of Engineers does for our State and Nation.

Regards,



John Trice
13706 Tajamar
Corpus Christi, Texas 78418
(361) 844-1032

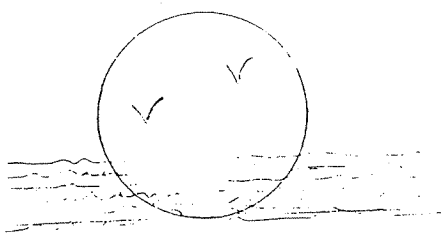
B12-01

Comment

Response

B12-01

Thank you for your comments



COASTAL BEND ENVIRONMENTAL COALITION
P.O. BOX 3512 Corpus Christi, 78404

July 18, 2002

District Engineer
U.S. Army COE, Galveston
P.O. Box 1229
Galveston, TX
77553-1229

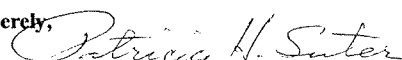
Dear Sir:

The Coastal Bend Environmental Coalition (representing 2500 members) has studied the North Padre Storm Damage Reduction and Environmental Restoration Project, Nueces County, Texas, Draft Environmental Impact Statement (DEIS) and is making the following comments which are attached in writing.

In general, we believe that the DEIS is deficient in several aspects which are listed in the enclosure. We have requested documents under the Freedom of Information Act and after those documents are received we will comment further.

We continue to believe that the proposed project is unnecessary, frivolous and may well pose a danger to this community. The project was begun as an economic development scheme and because the original developer has withdrawn, the original promises made to the public concerning costs to the citizens are no longer applicable. For this and environmental reasons, we ask that the project plans be discontinued.

Sincerely,


Patricia H. Suter, President
Chairman, Coastal Bend Sierra Club

B13-01

CORPUS CHRISTI RECYCLING
COASTAL BEND SIERRA CLUB - COASTAL BEND AUDUBON SOCIETY - OPUS
AUDUBON OUTDOOR CLUB - EARTH SAVE
MAIN GROUP, SINTON

Comment**Response**

B13-01

The Project was authorized by Congress in Section 556 of the Water Resources Development Act (WRDA) of 1999 as a storm damage reduction and environmental restoration project. The Corps was directed to construct the project if it were found to be technically sound and environmentally acceptable.

**COMMENTS BY THE COASTAL BEND ENVIRONMENTAL COALITION ON
THE DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE PACKERY
CHANNEL PROJECT**

1. What will be the effects of a hurricane surge on the Corpus Christi Naval Air Station? What will be the effect on evacuation of persons from Mustang and Padre Island in a hurricane (level 3,4, or 5) if this hurricane strikes straight on, north or south of the pass? The University of Texas did a study on this issue and we do not find the reference to the study in the DEIS.

B13-02

2. What will be the amount of siltation in the GIWW as a result of the opening of the channel? This issue was brought up in the mid 1980s in reference to the Lake Padre project which proposed a similar channel and the engineer of record did not feel that this is a problem. We understand the TXDOT is concerned. We request that this issue be studied and appropriate material distributed to interested parties.

B13-03

3. We are very concerned about the Tax Increment Finance District #2 (TIF). The public was told in 2001 before a vote to accept this TIF that the city's share of the \$30 million cost of the project would be funded by increases in the taxes within the district and that the developer would buy the bonds. The developer has withdrawn. Now the citizens are told that the monies for the project would come from bonds sold in three yearly increments and the interest would be paid by the increased taxes from development. But there are no plans for any development at this time. The figures given by proponents are all "pie-in-the-sky" and wishful thinking. The public was told that NO tax money would be used to pay interest on the bonds as the city would not insure them. They depended on the developer to assume the risk. Now it seems that the citizens would have to accept an unfinished project or pay additional costs if the development does not come. DEIS p. 1-13;4-57

B13-04

The citizens were also told in 2001 prior to the vote that the city's share of the cost would cover maintenance of the channel and amenities. Now we are told that amenities will have to wait until Phase 2 and that the city will have to go back to the federal or state government for another grant to construct the promised facilities. This could well be some 15 to 18 years down the road. In the meantime we will have a hole and two very expensive fishing piers. DEIS p. 66,68,69

4. Our consultants have calculated that the amount of dredged material is significantly more than what is quoted in the DEIS and than annual maintenance will be necessary. See enclosed calculation I.

B13-05

We are very concerned about the placement of any material not suitable for the beach. We have requested material under FOIA and will comment further after that material is received.

5. Several of our members have expressed concern about opening a channel so close

B13-06

Comment**Response**

B13-02

Surge was evaluated by URS (URS, 2002) for several scenarios, including the 10-year recurrence storm, the 50-year recurrence storm, a high-flow storm, and low-flow summer condition. The model used was the one-dimensional HEC-RAS model, which was calibrated to the data from the two-dimensional model used by Brown and Militello (1997). Data for the 10-year storm and the 50-year storm were taken from a flood insurance study for Nueces County by FEMA (FEMA, 1992) and data for the other two were from typical summer low-flow conditions and a tropical storm of unknown recurrence from Brown and Militello (1997). Results included the water surface and average channel velocity at numerous locations along Packery Channel. Data from near the intersection of Packery Channel and the GIWW (Station 12+58, see Figure 1-3 of the EIS) are as follows: summer low-flow, water surface = 0.11', velocity = 0.08 fps; 10-year storm, water surface = 2.2', velocity = 0.31 fps; 50-year storm, surface 8.32', velocity, 0.08 fps; high-flow storm, water surface = 2.1', velocity, 0.22 fps. The counter-intuitive velocity results for the 10-year and 50-year storms is because the island is overtopped and the channel is just a deeper part of the island and is no longer a significant conduit. Thus, when significant flow occurs, the channel makes little difference. Likewise, when the channel is acting as a conduit, when the flow opens out into the large Upper Laguna Madre, the effect of the channel is reduced to non-significance. The results of the evaluation are that the opening of Packery Channel will have little effect near Packery Channel and essentially none outside the immediate Packery Channel area, including the NAS.

B13-03

The GIWW at the intersection with Packery Channel is almost never maintained, being an area of natural scour. Most of the material trapped in the channel will be sand in Reach 1, which will be placed on the beach. Since modeling has shown that velocities in the channel would not be high, only minimal amounts of soft material should be transported to the GIWW. Fine-grained maintenance material from all of Reach 2 is only expected to be 3,000 cy per year and require five years before enough material accumulates to require maintenance.

B13-04

While included in the DEIS as background information, Non-Federal sponsor financing is not part of the NEPA process. Should problems arise with the Tax Incremental Financing (TIF), the City is still obligated to its share of the cost for the project and for maintaining the channel. Bonds will be sold by the North Padre Island Development Corporation, a creation of the City of Corpus Christi, and will be backed solely by the tax increment generated by the TIF zone. No guarantees from the City or use of City tax dollars are included in the plan.

B13-05

We have reviewed the calculations provided and do not agree with them. There is no statement of your assumptions concerning the rate of shoaling, and we do not agree with the quantities you project. The quantities used in the URS work were generated from modeling studies

utilizing existing data sets, and assumptions based on historic dredging records in the general project vicinity. Additional information on maintenance quantities can be found in response B13-16, below. As documented in the DEIS, only beach quality sand will be placed on the beach.

B13-06 The U.S. Coast Guard along with the U.S. Customs Service and other elements of the newly created Department of Homeland Security, as well as State and local law enforcement agencies, will have the responsibility for any security issues related to this project, as well as the Texas coastline in general. We have received no comments from the Naval Air Station.

to the Naval Air Station as this would make it much easier for a small boat to deliver terrorists to that site. Who will monitor boat activity in the channel and be responsible for this kind of activity?

6. In the portion of the channel in Reach 2, the increased boat traffic projected in the area of the Mollie Beattie Refuge is of great concern from both a pollution and other types of disturbance. Again, who is to monitor this activity and be responsible for minimizing impact? What about submerged grasses in this area? We request documentation on any decision that assumes the damage to be minimal or acceptable.

B13-07

7. We did not find mention of the endangered turtles. This year some 36 nests have been found on Mustang and Padre Islands. Turtles do occur in Corpus Christi Bay and this channel would give them another route to use. What provisions will be made to avoid impacting them? We understand that the Corps has a limit of 5 incidental kills in the Mansfield Channel. What would the corresponding number be at Packery Channel and will this negatively impact the turtle population? The nesting season runs from March through August and we suggest that no dredging be done during these months at the very least. See also piping plover problems in DEIS p. C-32

B13-08

8. We continue to believe that the proposed jetties are too short for safety and that the angle of the jetties to the Gulf is wrong. If we are right, who is liable for accidents which result from these deficiencies? Who owns the channel when it is dug? It was these issues which caused Westinghouse NOT to dig the channel when they owned the area now called Lake Padre. It was NOT the cost but the liability. We would like to see documentation to verify your position.

B13-09

9. It is mentioned that the city of Corpus Christi would provide a sand transport system to move excess sand from north of the jetties to the south. How much of the public beach would be used for this purpose? How noisy would the machinery be? Where exactly would the sand be placed at the terminus of the pipe and who would be responsible for spreading this sand?

B13-10

In the mid 1980s a sand bypass system was discussed for the Lake Padre project and at that time two sites in Florida were cited as examples. As far as we know today, none of these are operating at the present time. The reason given is that they are too expensive and too inefficient. Please include a report on these, or operating systems, in your final report. The cost of such a system should be given as the public will be asked to pay for this through the city.

10. In 1995 and 1997, the City of Corpus Christi requested bills in the state legislature to remove the area in front of the seawall from the jurisdiction of the Texas Open Beaches Law. For this to happen, the City agreed to build a parking lot and numerous amenities on property immediately north of the Holiday Inn. This

B13-11

Comment**Response**

B13-07

It is noted in the DEIS that the City will have full-time Park Police in the area to enforce the No-Wake Zone, a condition that does not exist at present. All seagrass and other impacts have been presented in the DEIS and State and Federal agency personnel have confirmed the location of SAV beds. The channel location was moved to the extent practical to reduce impacts to SAV.

B13-08

The non-jeopardy Biological Opinion (BO) from the FWS and a concurrence finding from the NMFS are attached in Appendix C. Since hopper dredges will not be used, no impacts to turtles from construction or maintenance dredging are expected. The take number mentioned applies to hopper dredge use and includes the entire Texas coastline. A take statement was not included in the DEIS since only NMFS and FWS can make those determinations. The BO includes an incidental take statement.

B13-09

A new engineering study was conducted for the USACE by URS. It used newly-generated wind and wave data, and did not rely on earlier studies, to insure independence. The jetty design was based on this study. However, in essence the results of the URS study did verify the findings of earlier engineering studies. The waters in and around the project will be open waters of the United States and the State of Texas, similar to the waters around other passes to the Gulf such as Port Aransas and Port Mansfield. As such, the waters will be subject to the same Federal and State laws.

B13-10

The PAs (4N and 4S) that would receive the material from the sand bypass system are shown on Figure 1-2 of the EIS, which shows the area extent of possible placement. PA 4N will not be used during construction and maintenance is expected to occur only every other year, using either PA 4N or PA 4S, not both. In addition, the expected amount of material will not use the full extent of either PA 4N or PA 4S. PA 4N has been reduced in size, based on FWS recommendation that maintenance material not be placed within 1,000 feet of Newport Pass. A sand by-pass system is basically a small dredge that moves material from one side of the jetties, through, a buried pipeline, to the other side of the jetties to counteract scour. Final details have not been worked out, since that would occur in final engineering design, but would be the City's responsibility as part of maintenance.

B13-11

The State Legislature passed bills in 1995 and 1997 establishing the private property line as the toe of the seawall. As part of these bills, a 300 linear foot strip of property behind the seawall was required to be given to the City of Corpus Christi by the private property owners. This was done. The seawall has a pedestrian easement on it as required by State statutes. Public rights to the beach extend from the toe of the seawall east. The seawall itself is open to the public by the easement referenced above. The City must comply with the Texas Open Beaches Act in regard to vehicular access to the beach. The paving of the

parking lot is included in the TIF zone, but is not part of the Federal project. To the greatest extent possible, access is being provided to virtually every aspect of the Federal project. For example, handicapped access is being provided on the jetties.

facility was included in the propaganda presented to the public in 2001 prior to the vote for the TIF. It is NOT included in the current plans. What provisions have been made to comply with the American Disabilities Act? How will the public access the newly created beach? What rights will the public have to the seawall? The Open Beaches Act allows the public use of land 200 feet landward of mean high tide. Will the new beach be wider than that? If so, what are the public rights? Will cars be allowed on the beach? See enclosures II.

11. What happens if there are cost overruns? Where is the money to come from?

B13-12

12. It is our understanding that the Texas General Land Office agreed under pressure to the destruction of some critical dunes resulting from the moving of the channel from its original position on the promise that the city would restore the dunes after construction. Dune restoration is not easy to do and city does not have a good record in this regard. We request documentation of methods and timing on the dune restoration or other mitigation for the loss of these critical dunes. DEIS p. 1-14; 6-1; 6-3

B13-13

13. The March 2002 issue of the National Geographic magazine had an article in their EARTH PULSE section commenting on the importance of Mustang and Padre Islands for the protection of wildlife and people. They emphasize the importance of the sand dunes in this regard. Cutting a channel decreases this protection. Please document any comments on the decrease in hurricane protection on the mainland which will occur if this channel is dug. In the present condition, any storm expends a lot of its energy in opening of the washover channels during the storm surge.

B13-14

14. We note that the Corps plans to dig a channel for the purpose of placing sand in front of the seawall on Padre Island and not for the purpose of navigation and recreation. However, you will be creating an "attractive nuisance" and the channel will be utilized extensively by the public. The original purpose of the beach re-nourishment was for economic development in that area. Because the developer has withdrawn his original \$677 million plans, does this not change the picture? In the Rivers and Harbors Act of 1899, the Corps is supposed to dredge channels for the purpose of navigation and environmental enhance. The DEIS says that any environmental aspects are minimal at best. It seems to us that the Corps is not acting in the meaning of the original purpose. Re-nourishment of beaches is not been shown to have any lasting effect and channels with jetties have shown to cause erosion of beaches on either side of the area. Comment on the probable erosion of Mustang Island near the mid-point and of Padre Island in Kleberg County as a result of the jetties extending into the Gulf. We request documentation for your opinion on this issue. DEIS p. 2-9

B13-15

<u>Comment</u>	<u>Response</u>
B13-12	Responsibility for cost overruns on a Federal project are controlled by the Federal authorization, Federal law, and a project cooperation agreement between the Corps and the project sponsor.
B13-13	The City's Dune Protection Permit from the GLO is included in Appendix C
B13-14	A careful examination of Figure 3.4-2D will show that the channel location falls almost entirely between the dunes and is located largely in the natural swale that now exists. This swale is the location of the wash-over pass that has occasionally opened during the 20 th century, and currently has a road down it. Therefore, the channel will remove only a small portion of the dune system (1.5 acres).
B13-15	<p>The DEIS states in Section 1.0 the purpose of the project as directed by Congress.</p> <p>There is no reference on p. 2-9 to erosion near the midpoint of Mustang Island or of Padre Island in Kleberg County. However, as an examination of aerial photographs of Mansfield Pass and Aransas Pass will show, erosion occurs near the jetties. This is why a sand-bypass system has been included for the Packery Channel project.</p>

I

RE: Packery DEIS

B13-16

The volume (cy) of sedimentation per reach is not specifically provided.
The frequency of maintenance dredging is not specifically described.

However....

Pg 1-7. Estimated 50-year maintenance volume is 11,057,500 cy (or 221,150 cy per year)

Page 1-7. The greater volume of maintenance dredging will occur in the reach from the Gulf into the inlet (Reach 1) from STA 168+00 to 198+00 (or about 3000 ft), and it will be 70 % of annual.

$221,150 \text{ cy per year} \times .70 = 154,000 \text{ cy}$

Original channel to be dredged to $-12 +2 +2 = -16$ feet MLT

With 5 feet of sedimentation = - 11 ft MLT channel

Assuming $3000' \text{ (Reach 1)} \times 120' \text{ (bottom width)} \times 5 \text{ ft sedimentation} / 27\text{ft}^3 = 66,000 \text{ cy}$
Divide $11,057,500 \text{ cy}$ by $66,000 \text{ cy} = 168 \text{ cycles in 50 years}$ or **3 maintenance cycles a year to keep it between -16 to -11 ft MLT.**

With 10 feet sedimentation = - 6 ft MLT Channel (= essentially non-navigable for model vessel)

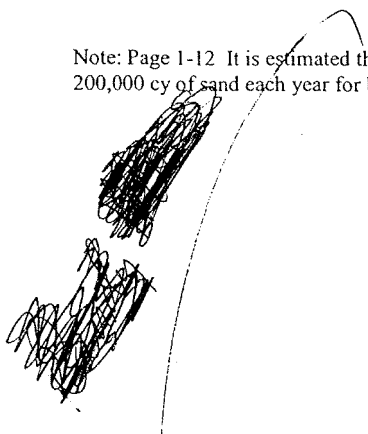
Assuming $3000' \times 120' \text{ (bottom width)} \times 10 \text{ ft sedimentation} / 27\text{ft}^3 = 133,333 \text{ cy}$
Divide $11,057,500 \text{ cy}$ by $133,333 \text{ cy} = 83 \text{ cycles in 50 years}$ or **1.7 cycles per year to keep between -16 and -6 feet MLT**

Running the calculation backward:

If $154,000 \text{ cy year}$ ($221,150 \text{ cy per year} \times .70 = 154,000 \text{ cy}$)

Then $154,000 \times 27 = 4,158,000 / (120 \times 3000) = 11.55 \text{ feet sedimentation per year} = - 4.45 \text{ MLT channel in one year}$ (non-navigable for unknown part of year).

Note: Page 1-12 It is estimated that *annual channel maintenance* and sand bypass will provide over 200,000 cy of sand each year for beach replenishment. (That means expecting *annual* maintenance)



Comment**Response**

B13-16

Section 1.2.2 in the DEIS failed to mention that the 11,057,500 cy of maintenance material includes an estimated 7,997,500 cy from the sand bypass system. Therefore the maintenance material from Reach 1 is estimated to be 58,200 cy per (although maintenance is only expected every other year), calculated as 221,150 cy/yr total – 159,950 cy/yr (sand bypass) – 3,000 cy/yr (Reach 2). Seventy percent of 58,200 cy = 40,740 cy = 1,099,980 cu ft. Station 168+00 to station 198+00 is 3,000 feet long by 122 feet wide or 366,00 sq ft. Therefore, there would be $1,099,980 / 366,000 = 3.0$ ft of accumulation per year. With maintenance dredging every other year, the channel would shoal to roughly –10' MLLW before maintenance.

S.B. No. 1688

AN ACT

1-1 relating to the establishment of the line of vegetation along the
1-2 Gulf of Mexico where a natural vegetation line does not exist.

1-3 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

1-4 SECTION 1. Section 61.017, Natural Resources Code, is
1-5 amended by adding Subsection (c) to read as follows:

1-6 (c)(1) In an area of public beach where a seawall structure
1-7 constructed in its entirety as a single structure of one design
1-8 before 1970 and continuously maintained with a height of not less
1-9 than 11 feet above mean low tide interrupts the natural line of
1-10 vegetation for a distance not less than 4,000 feet nor greater than
1-11 4,500 feet, the line of vegetation is along the seaward side of the
1-12 seawall for the distance marked by the seawall, provided that prior
1-13 to December 31, 1996:

1-14 (A) a perpetual easement has been granted in
1-15 favor of the public affording pedestrian, noncommercial use along
1-16 and over the entire length of the seawall and adjacent sidewalk by
1-17 the general public;

1-18 (B) fee title to the surface estate to an area
1-19 for public parking and other public uses adjacent to the seawall
1-20 has been conveyed to and accepted by a public entity, which area
1-21 contains sufficient acreage to provide at least one parking space
1-22 for each 15 linear feet of the seawall, is located within the
1-23 center one-third of the length of the seawall, and has frontage on
2-1 the seawall for at least 300 linear feet; and

2-2 (C) permanent roadway easements exist within
2-3 1,000 feet of each end of the seawall affording vehicular access
2-4 from the nearest public road to the beach.

2-5 (2) A line of vegetation established as described in
2-6 this subsection shall be the landward boundary of the public beach
2-7 and of the public easement for all purposes. Fee title to all
2-8 submerged land as described in this code shall remain in the State
2-9 of Texas.

2-10 SECTION 2. The change in law made by Subsection (c), Section
2-11 61.017, Natural Resources Code, as added by this Act, establishes
2-12 the landward boundary of the public beach and of the public
2-13 easement in any instance in which the circumstances described in
2-14 Subsection (c), Section 61.017, Natural Resources Code, as added by
2-15 this Act, including the dedication of the public easement and the
2-16 conveyance of the public parking and use area, are completed prior
2-17 to December 31, 1996. Any court judgment in effect prior to the
2-18 effective date of this Act regarding circumstances described in
2-19 Subsection (c), Section 61.017, Natural Resources Code, as added by
2-20 this Act, is modified by that section to the extent that the
2-21 judgment is in conflict with that section.

2-22 SECTION 3. This Act takes effect September 1, 1995.

2-23 SECTION 4. The importance of this legislation and the
2-24 crowded condition of the calendars in both houses create an
2-25 emergency and an imperative public necessity that the
3-1 constitutional rule requiring bills to be read on three several
3-2 days in each house be suspended, and this rule is hereby suspended.

1995

1997

1-1 AN ACT
1-2 relating to the line of vegetation in an area of public beach near
1-3 certain seawalls.
1-4 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:
1-5 SECTION 1. Section 61.017(c)(1), Natural Resources Code, is
1-6 amended to read as follows:
1-7 (c)(1) In an area of public beach where a seawall structure
1-8 constructed in its entirety as a single structure of one design
1-9 before 1970 and continuously maintained with a height of not less
1-10 than 11 feet above mean low tide interrupts the natural line of
1-11 vegetation for a distance not less than 4,000 feet nor greater than
1-12 4,500 feet, the line of vegetation is along the seaward side of the
1-13 seawall for the distance marked by the seawall, provided that prior
1-14 to September 2, 1997 ~~(December 31, 1996)~~:
1-15 (A) a perpetual easement has been granted in
1-16 favor of the public affording pedestrian, noncommercial use along
1-17 and over the entire length of the seawall and adjacent sidewalk by
1-18 the general public;
1-19 (B) fee title to the surface estate to an area
1-20 for public parking and other public uses adjacent to the seawall
1-21 has been conveyed to and accepted by a public entity, which area
1-22 contains sufficient acreage to provide at least one parking space
1-23 for each 15 linear feet of the seawall, is located within the
1-24 center one-third of the length of the seawall or not farther than
2-1 300 feet from that center one-third, and has frontage on the
2-2 seawall for at least 300 linear feet; and
2-3 (C) permanent roadway easements exist within
2-4 1,000 feet of each end of the seawall affording vehicular access
2-5 from the nearest public road to the beach.
2-6 SECTION 2. Any court judgment in effect on the effective
2-7 date of this Act regarding circumstances described by Section
2-8 61.017(c)(1), Natural Resources Code, as amended by this Act, is
2-9 modified by that section, as amended, to the extent that the
2-10 judgment is in conflict with that section.
2-11 SECTION 3. This Act takes effect September 1, 1997.
2-12 SECTION 4. The importance of this legislation and the
2-13 crowded condition of the calendars in both houses create an
2-14 emergency and an imperative public necessity that the
2-15 constitutional rule requiring bills to be read on three several
2-16 days in each house be suspended, and this rule is hereby suspended.

President of the Senate Speaker of the House
I certify that H.B. No. 2847 was passed by the House on April
25, 1997, by a non-record vote.

Chief Clerk of the House
I certify that H.B. No. 2847 was passed by the Senate on May
12, 1997, by a viva-voce vote.

Secretary of the Senate
APPROVED: _____
Date

Governor

1997

II C

AN ACT

relating to artificial processes affecting ownership of coastal public land.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

SECTION 1. Subchapter D, Chapter 33, Natural Resources Code, is amended by adding Section 33.136 to read as follows:

Sec. 33.136. PROPERTY RIGHTS: PRESERVATION OF LITTORAL RIGHTS. (a) Notwithstanding any law to the contrary, a person may not undertake, on the public beach, as defined in Section 61.001(8), Texas Natural Resources Code, an action relating to erosion response that will cause or contribute to shoreline alteration before the person has conducted and filed a coastal boundary survey in the same manner as the survey of public land required by Chapter 21 and any applicable rule of the commissioner. On filing of the survey, the shoreline depicted on the survey is a fixed line for the purpose of locating a shoreline boundary, subject to erosion landward of that line. A coastal boundary survey conducted under this section may not be filed until the commissioner gives notice of approval under Subsection (c).

(b) The survey must contain the following statement: "NOTICE: This survey was performed in accordance with Section 33.136, Natural Resources Code, for the purpose of evidencing the location of the shoreline in the area depicted in this survey as that shoreline existed before commencement of erosion response activity on the public beach, as required by Chapter 33, Natural Resources Code. The line depicted on this survey fixes the shoreline for the purpose of locating a shoreline boundary, subject to erosion landward as provided by Section 33.136, Natural Resources Code."

(c) Within 30 days after the date the commissioner approves a coastal boundary survey fixing the location of the shoreline under this section, the commissioner shall provide notice of the commissioner's action by:

(1) publication in the Texas Register;
(2) publication for two consecutive weeks in a newspaper of general circulation in the county or counties in which the land is located; and

(3) filing a copy of the commissioner's decision in the archives and records division of the land office.

(d) A person who claims title to land as a result of accretion, reliction, or avulsion on the public beach in an area where the shoreline was or may have been changed by an action relating to erosion response must, in order to prevail in the claim, prove that:

(1) a change in the shoreline has occurred;
(2) the change did not occur as a result of the claimant's actions, the action of any predecessor in title, the action of any grantee, assignee, licensee, or person authorized by the claimant to use the claimant's land, or an erosion response activity; and

(3) the claimant is entitled to benefit from the change.

(e) An upland owner who, because of erosion activity undertaken by the commissioner, ceases to hold title to land that extends to the shoreline as altered by the erosion response activity is entitled to continue to exercise all littoral rights possessed by that owner before the date the erosion response activity commenced, including rights of ingress, egress, boating, bathing, and fishing.

(f) In this section, "erosion response" means an action

1997

<http://tlis/cgi-bin/tlis/viewtext.cmd?LEG=75&SESS=R&CHAMBER=S&BILLTYPE=B&...> 6/19/2002

3-12 intended to address coastal erosion, mitigate the effect of coastal
3-13 erosion, or maintain or enhance beach stability or width. The term
3-14 includes:
3-15 (1) beach nourishment;
3-16 (2) sediment management;
3-17 (3) beneficial use of dredged material;
3-18 (4) construction of breakwaters;
3-19 (5) dune creation or enhancement; and
3-20 (6) revegetation.

3-21 SECTION 2. This Act takes effect September 1, 1997, and
3-22 applies only to an erosion response action initiated on or after
3-23 that date.

3-24 SECTION 3. The importance of this legislation and the
3-25 crowded condition of the calendars in both houses create an
4-1 emergency and an imperative public necessity that the
4-2 constitutional rule requiring bills to be read on three several
4-3 days in each house be suspended, and this rule is hereby suspended.

President of the Senate
I hereby certify that S.B. No. 1050 passed the Senate on
April 30, 1997, by a viva-voce vote.

Speaker of the House

Secretary of the Senate
I hereby certify that S.B. No. 1050 passed the House on
May 21, 1997, by a non-record vote.

Chief Clerk of the House

Approved:

Date

Governor

Rick and Regina Guerra
14506 Villa Maria Isabel
Corpus Christi, Tx. 78418

Questions for USACE concerning the DEIS of the locally known Packery Channel
Project Public Hearing July 18, 2002.

PACKERY
CHANNEL
NEIGHBORHOOD
WEST of
SH361
BRIDGE

1. Requesting of modeling to identify, quantify, and qualify the storm damage (including flooding) by all levels (including but not limited to hurricane categories) of storms due to surges, wind, and all other environmental sources on my property/neighborhood with and without the existence of the opening of Packery Channel to the Gulf of Mexico, including storm surges and winds which directly "hit" Packery Channel, hit directly North, and hit directly South of Packery Channel. Requesting solutions and the inclusion of the solutions in the EIS preventing the damage that such research may identify. "EROSION"
2. Requesting of modeling to identify, quantify, and qualify the storm damage (including flooding) by all levels (including but not limited to hurricane categories) of storms due to surges, wind, and all other environmental sources on my property/neighborhood with and without the replacement and revegetation of Primary and Secondary Sand Dunes (that are identified in the DEIS that will be lost due to the project) adjacent to the North and South sides of the proposed jetties of Packery Channel East of SH361 bridge, including storms which directly "hit" Packery Channel, hit directly North, and hit directly South of Packery Channel. Requesting solutions and inclusion of the solutions in the EIS preventing any damage that such research may identify. "EROSION"
3. Why are the above mentioned dunes being lost and not replaced according to the DEIS, when a letter from the Honorable Judge Richard Borchard dated June 11, 2002 states that the Dune Permit granted by the Commissioners' Court May 29th, 2002 is authorized only if "the proposed activity will not materially weaken dunes or materially damage dune vegetation, or reduce the effectiveness of any dune to protect against erosion and high wind and water." Attached is a copy of the letter.
- * 4. Request a detailed listing of all the differences between the USACE study and the Naismith Engineering 1999 proposal of the Packery Channel project concerning the amounts and suitability for beach renourishment of all maintenance dredging of Reach 2.
- * 5. Request of the location of the new MMPA since the Nueces County Packery Channel Park has been withdrawn by the sponsor (see attached letters) and the request of sufficient time to study the supplemental DEIS of the newly identified MMPA. Who has/had the political/legal authority to offer and withdraw the Nueces County Packery Channel Park as the former MMPA?
6. Requesting of modeling to identify, quantify, and qualify all the environmental effects/damage to property along Reach 2 with and without a bulkhead or other harden surface due to the wake of recreational craft above 5 mph if it is not enforced 24 hrs a day, using the Port Aransas Channel as the comparison for recreational craft traffic. Including but not limited to the method to be used to

B14-01

B14-02

B14-03

B14-04

B14-05

B14-06

Comment**Response**

- B14-01 Please see Response to Comment B13-02. With enforcement of a No-Wake Zone in front of your property, there should be no increase in erosion from boat traffic.
- B14-02 Please see Response to Comment B13-14. The modeling discussed in the Response to Comment B13-02 included the fact that the 1.5 acres of dune would be gone.
- B14-03 The City's Dune Protection Permit from the GLO is included in Appendix C of the FEIS.
- B14-04 This will not be provided. The EIS covers the existing Federal project, not earlier permit applications.
- B14-05 The new MMPA is shown in Figure 1-3 and others.
- B14-06 This will not be provided. The GLO lease, attached to the EIS in Appendix A, includes the stipulation that a no-wake zone will be enforced by the City and the erosion analysis conducted by URS and available on the Galveston district website (www.swg.usace.army.mil) indicates no need for erosion control measures in Reach 2.

enforce the "no wake" zone 24 hrs a day, since the existing "no wake" zone is not currently enforced along Packery Channel in front of the existing homes in Reach 2.

7. Will any property along Packery Channel be provided with bulkheads or harden surface West of SH361 bridge?
8. What kind of protections are being afforded to the SH361 bridge in regards to potential collisions by watercraft and storm surges?

Atty. Regan L. Hem
7/18/02

B14-07

B14-08

Comment**Response**

B14-07

Erosion control will extend west past the SH 361 bridge to the extent necessary to protect the bridge. Beyond the constriction imposed by the bridge, URS determined that no erosion control is necessary and none is planned.

B14-08

Armoring of the bridge is described in the FEIS, and in greater detail in the URS report available on the Galveston district website (www.swg.usace.army.mil).

7/18/2002

Mark Gilliam
14238 Sand Dollar
Corpus Christi, TX 78418

Attention: US Army Corp of Engineers


Packery Channel Environmental Impact Hearing Questions

Please answer the following questions with regard to the Environmental Impact Hearing:

1. Why is the proposed channel to be dug 150' to 300' north of the existing channel (Reach 1 east of SH361 bridge)?
2. Was the economic impact on the adjacent property owners considered prior the making the decision to move the channel north?
3. Did the economic impact of the adjacent property owners have any bearing on the decision to move the channel (Reach 1 east of SH361 bridge)?
4. Who benefited from moving the channel north 150' to 300' (Reach 1 east of SH361 bridge)?
5. When was the decision to move the channel made (Reach 1 east of SH361 bridge)?
6. Who requested that the channel be moved (Reach 1 east of SH361 bridge)?
7. Who authorized the channel to be moved (Reach 1 east of SH361 bridge)?
8. Will it require additional construction expensed to dig the channel north of the existing channel through the dunes and fill in the existing channel?
9. Will there be any development of the Packery Channel Park?
10. Why was the property adjacent to the Packery Channel Park excluded from the TIF?
11. Are there any plans to develop the property adjacent to the Packery Channel Park that was excluded from the TIF.
12. Can commercialization of the land adjacent to the Packery Channel Park, which was excluded from the TIF, be restricted?
13. Who benefited by excluding the property adjacent to the Packery Channel Park from the TIF?
14. Is there any scenario that could result in the City having to pay the 10+ million dollar portion of the project? If so, what scenario would result in the City having to pay the 10+ million portion of the project?
15. Are the bonds being sold to finance the City's portion of the project guaranteed by the City or the seller?

Thank you for your consideration. If possible, I would like your responses mailed to me.

Sincerely,


Mark Gilliam

B15-01

B15-02

B15-03

B15-04

B15-05

B15-06

B15-07

B15-08

B15-09

B15-10

B15-11

B15-12

B15-13

B15-14

B15-15

Comment**Response**

- B15-01 The location of the channel has not been moved 150' to 300' north, east of SH 361. At present there is no channel east of SH 361. The proposed location of the channel to be excavated follows an existing washover. This is the same location that has been indicated on several permit applications, and in the Naismith Engineering work of the mid-1990s on the locally preferred project. We are unaware of any other location for the proposed channel.
- B15-02 The location of the channel was not moved. No economic analysis was performed in response to WRDA 1999 (PL 106-53).
- B15-03 Please see Comment B15-02.
- B15-04 Please see Comment B15-02.
- B15-05 Please see Comment B15-02.
- B15-06 Please see Comment B15-02.
- B15-07 Please see Comment B15-02.
- B15-08 Please see Comment B15-02.
- B15-09 As an examination of Figure 4.11-b will show, there have been no changes in the recreational development proposed by the City. The dredged material placement area (MMPA) identified in the DEIS as located in Packery Channel Park has been moved and the park will not be affected by dredged material placement.
- B15-10 All single family residential property was excluded from the TIF zone. This includes the Padre Isles II lots 34, 35, 40, 41, 42, and 43, which are adjacent to the Park.
- B15-11 This is private property and the City has no knowledge of any specific development plans.
- B15-12 Development can only be restricted through legitimate zoning. The current zoning of this property is residential.
- B15-13 No one. The taxes and tax rate inside and outside the TIF zone are the same. The only difference in being left out of the TIF zone is that no improvements can be made to that property using TIF zone funding.
- B15-14 As the cost-sharing, non-Federal sponsor, the City is obligated to pay its portion of construction and all maintenance for the project.
- B15-15 The bonds will be sold by the North Padre Island Development Corporation, a creation of the City of Corpus Christi and will be backed solely by the tax increment generated by the tax incremental financing zone. No guarantees from the City or use of City tax dollars are included in the plan.

July 18, 2002

To: Lloyd H. Saunders, Ph.D.

Re: Support letter for Packery Channel Project—Corpus Christi, Texas

Dear Sirs:

I wish to express my support for the Packery Channel project because it will help to stabilize our beach at the seawall, help our economy and development, and provide storm surge protection. It is time to get on with this important project now!



Linda Charlton
13526 Camino De Plata, Ct.
Corpus Christi, Texas 78418

B16-01

Comment

Response

B16-01

Thank you for your comments.

July 18, 2002

Re: Letter of Support
Packery Channel Project
Corpus Christi, Texas

Lloyd H. Saunders, Ph. D.
Galveston District, Corps Of Engineers
P. O. Box 1229
Galveston, Tx 77553-1229

Dear Sir,

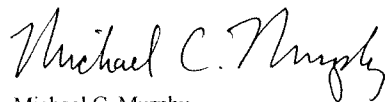
Please consider this support letter in lieu of my attendance at your public hearing on July 18, 2002 in Corpus Christi, Texas. In general, the proposed project will have a beneficial impact on the environment and economy of the Corpus Christi area.

The dredging and maintenance of the channel from the Gulf of Mexico to the Laguna Madre will provide additional water flow to maintain and possibly improve critical marine resources in the area. Utilization of the dredged spoil material can provide additional dune and beach protection that will benefit residential and commercial interests on the island.

Economically, the additional tax base and increased tourism will benefit the city of Corpus Christi, residents and commercial interests throughout the area. Responsible development in the area will increase property values and tax revenues.

I have seen the Packery Channel open and close numerous times while living here over the past 48 years and strongly believe the project implementation will benefit all interests. Your favorable consideration of this project is greatly appreciated.

Sincerely,



Michael C. Murphy
13521 Camino De Plata Ct
Corpus Christi, Texas 78418

B17-01

Comment

Response

B17-01

Thank you for your comments

July 18, 2002

Loyd H Sanders, Ph.D.
Galveston District, Corps Of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Re: Packery Channel Project in Corpus Christi, Texas

Dear Sir:

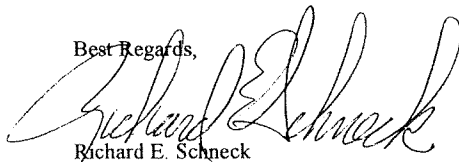
This is a letter of support for the above mentioned project. This project will have a positive impact on both the environment and the economy in the Corpus Christi and surrounding areas.

This Project will improve the water circulation in the south end of Corpus Christi Bay and the Padre Isles area. The limited water circulation has caused a hyper saline environment and the opening of the Packery Channel will enhance the water quality in the north end of the Laguna Madre and the south portion of Corpus Christi Bay.

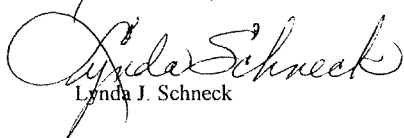
The dredging and maintenance of the Packery Channel will renourish the beach in front of the existing seawall on Padre Island helping to stabilize it and maintain the critical storm surge protection for the residential development in the area. It will also provide a tremendous new recreational potential enhancing the economy for the area.

I strongly support the implementation of the Packery Channel Project. Thank you for your consideration.

Best Regards,



Richard E. Schneck



Lynda J. Schneck

B18-01

Comment

Response

B18-01

Thank you for your comments



U.S. Army Corps
of Engineers
Galveston District

PUBLIC COMMENT

North Padre Island Storm Damage
Reduction and Environmental
Restoration Project
July 18, 2002

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Written comments may also be sent directly to:

Mr. Sam Watson
U.S. Army Corps of Engineers
Galveston District
Planning Division
P.O. Box 1229
Galveston, TX 77553-1229
Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

B19-01

Name: CLIFF TARSKY
Address: 5202 WOODBRIDGE
City, State and Zip: CORPUS CHRISTI, TX 78413

Comment: PACKART CHAMEL WILL HELP
EVERY ONE IN SOME WAY & SHOULD
BE DONE.

Comment

Response

B19-01

Thank you for your comment



U.S. Army Corps
of Engineers
Galveston District

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P.O. Box 1229
Galveston, TX 77553-1229
Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

B20-01

Name: NEVA SUNDVAHL - CRUZ / JIM CRUZ
Address: 13725 A LA ENTRADA CALLE
City, State and Zip: CORPUS CHRISTI, TX 78418

Comment: AS A PADRE ISLES HOMEOWNER/RESIDENT MY
HUSBAND AND I ARE IN TOTAL SUPPORT OF PACKER
CHANNEL. WE HAVE WORKED ON ITS PASSING IN ALL
STAGES AND WILL DEFINITELY SUPPORT THE CORPS OF
ENGINEER.

NOW, LETS MOVE THIS PROJECT FORWARD
AND ENJOY ITS' BENEFIT IN OUR LIFE TIME.

neva Sundvall
361- 949-8788
EMAIL - NEVA PI@aol.com

Comment

Response

B20-01

Thank you for your comments



U.S. Army Corps
of Engineers
Galveston District

PUBLIC COMMENT

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July 18, 2002

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P.O. Box 1229
Galveston, TX 77553-1229
Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

B21-01

Name:

TERRY KING

Address:

PO Box 508

City, State and Zip:

ROBSTOWN, TX. 78380

Comment:

THANK YOU FOR YOUR HARD WORK ON
THIS PROJECT.

THE CHANNEL SHOULD BE OPENED.

ACCESS TO THE GULF HAS BEEN RESTRICTED
SINCE THE DREDGING OF THE ICW. THIS
HAS EFFECTED WATER QUALITY & SALINITY LEVELS
IN THE LAGUNA MADRE AND C.C. BAY.

PLEASE CONSIDER OPENING YARBROUGH PASS NEXT.

Comment

Response

B21-01

Thank you for your comments



U.S. Army Corps
of Engineers
Galveston District

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Planning Division
P.O. Box 1229
Galveston, TX 77553-1229
Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

Name: JOYCE JARMON
Address: 842 RETAMA
City, State and Zip: CORPUS CHRISTI, TX 78408

Comment: Attn: Carolyn Murphy
Your presentation on the environmental study and assessment regarding the proposed Packery dredging and the immediate impact was impressive. However, I have a concern that doesn't seem to have been addressed, and that is the secondary impact the increased boat traffic and consequent anticipated commercial development will have on this fragile environment in a very detrimental fashion.
Specifically, the current packery area is the first landfall for birds returning in migration across the Gulf in the fall from Mexico, Central + South America. If you have ever seen the ground there covered with weak + exhausted painted buntings (for example) you will have a graphic memory of the extreme importance of this function in preserving the bird life of the U.S.A. I fear the building of tall buildings, increased surface and boat traffic will interfere - possibly terminate this current essential function of this area. Was this addressed in your survey?
(Page 2)

B22-01

Comment**Response**

B22-01

Very little land area will be lost, relative to the situation that exists now. The beach area is already heavily used. Secondary development is expected to occur with or without the project, although it may occur more rapidly with the project. This issue was not raised at any of the public meetings held prior to the preparation of the DEIS nor was it raised by State and Federal resource agency biologists.

Also, I fear the impact on the grasses and small fish that now inhabit and need the shallow waters you appear for dredging on the west entrance to Pookany from the interoastal. This is a vital fish breeding and fish and bird feeding area of our water system.

B22-02

I also question the decision to use the north edge of the proposed channel (toward Gahn Road) for parking, picnicking, kiosks, etc. This is a prime sand and wetland area used extensively by shorebirds and should not be disturbed for commercial and recreational purposes.

B22-03

I admit to a critical attitude toward a project so mislabeled as an environmental project when it is presented as a commercial enhancement program by the city and becomes a navigational program as assessed by the Corps.

B22-04

Please is this an unabashed attempt to confuse the citizens?

Joyce Jarmon
842 Rotama
Corpus Christi Tx
78408

<u>Comment</u>	<u>Response</u>
----------------	-----------------

- | | |
|--------|---|
| B22-02 | Section 4.4.2 of the EIS discusses the impacts to seagrasses and the location of seagrass beds of Packery Channel near it's intersection with the GIWW is shown on Figure 3.4-2a. As an examination of Figure 3.4-2a will show, there are no impacts to seagrass in the 5,500 feet of channel shown on that figure. The channel alignment was adjusted, to the extent possible, to avoid impacts to seagrasses. |
| B22-03 | All of the facilities, except the kiosks along the beach and the Administration/Maintenance Building, are on the footprint of PA2, so there will be no additional impacts to vegetation. The high salt marsh area between the proposed roads (Figure 4.11-1a) was specifically avoided. |
| B22-04 | As noted in Section 1.0 of the DEIS, the project title reflects its authorization. Section 1.1 presents the purpose of, and the need for, the project. |



U.S. Army Corps
of Engineers
Galveston District

PUBLIC COMMENT

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July 18, 2002

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Galveston District
Planning Division
P.O. Box 1229
Galveston, TX 77553-1229
Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

Name:

Carol Ramsey

Address:

14764 DASMARIPAS

City, State and Zip:

Corpus Christi, TX 78418

Comment:

Levee is wasting! Let go on
the deep channel.

B23-01

<u>Comment</u>	<u>Response</u>
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B23-01	Thank you for your comment
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U.S. Army Corps
of Engineers
Galveston District

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P.O. Box 1229
Galveston, TX 77553-1229
Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

Name:

Judy Sengel

Address:

13817 Jolly Roger

City, State and Zip:

CC, TX 78418

Comment:

*Why are we repeating
this issue again !!?
It has passed - get on
with digging it. Now!!*

B24-01

Comment

Response

B24-01

Thank you for your comments.



U.S. Army Corps
of Engineers
Galveston District

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Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

Name: Beverly Bloess
Address: 15646 3rd Avenue East Dr.
City, State and Zip: Corpus Christi, TX 78418

Comment:

Hope this is done fast!

B25-01

Comment

Response

B25-01

Thank you for your comment



U.S. Army Corps
of Engineers
Galveston District

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Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

Name: _____

Address: _____

City, State and Zip: _____

Comment:

*This City needs progress Mr. Watson
- we need parking Channel !!!*

Eileen McElain

B26-01

Comment

Response

B26-01

Thank you for your comment



U.S. Army Corps
of Engineers
Galveston District

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Email: Sam.Watson@swg02.usace.army.mil

7-20-02

Name: Neva Sundwahl-Cuy
Address: 13725 9 La Entada
City, State and Zip: Corpus Christi, TX 78418

Comment:

We are anxious to see the Packery
Channel project through! It has
been so long, we hope to enjoy it
in our lifetime! Plans and development
efforts on your part are greatly appreciated
by most Islanders.

Sincerely,
Neva Sundwahl

B27-01

Comment

Response

B27-01

Thank you for your comment



U.S. Army Corps
of Engineers
Galveston District

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Galveston, TX 77553-1229
Facsimile: 409-766-3931
Email: Sam.Watson@swg02.usace.army.mil

Name: Kathy & Ralph Coker
Address: 13909 Island Colon
City, State and Zip: Corpus Christi, TX 78418

Comment:

see Attached comments

Public Comments

North Padre Island storm damage reduction and environmental restoration project

July 20, 2002

My wife and I attended the hearing on July 18, 2002 and are submitting the following comments in support of the project:


All projects of this size have positive and negative effects but we feel the facts presented at the hearing indicate the project has been thoroughly studied and the positive effects far surpass the negative effects.

We live on Padre Island south west of the seawall. Our storm surge protection is the seawall and we support the beneficial effect that this project will have in maintaining the seawall.

The economic benefit of the project is already being realized. Since funding for the project became certain property values in the area have increased rapidly. The Tax Increment District revenues are already far greater than had been anticipated for the project at this stage. The recent sale of the water front lot next to our house shows the rapid increase in property values. The lot was previously purchased in 1998 for \$68,500 and resold recently for \$215,000.

The environmental benefits of the project will more than off set any adverse effects. We urge that the DEIS be approved.


Ralph & Kathy Coker



B28-01

<u>Comment</u>	<u>Response</u>
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B28-01	Thank you for your comments
--------	-----------------------------

To: U.S. Army Corps of Engineers / Attn: Mr. C. Murphy July 20, 2002
Subject: In opposition to the proposed
dredging of Packery Channel

Mrs. Mary Pat Slavik
412 Palmetto St.
Corpus Christi, TX 78412

Dear Mrs. Murphy:

Christi City Council member
have studied the Packery Channel
project and I am opposed to the project.
some of my more important objections:

① As a former City Official and District #4 Rep,
I am concerned that the opening of Packery
Channel will allow a more rapid influx of any
storm surges from Gulf storms, and therefore
will increase the rapidity of flooding on the
Kennedy Causeway and the shores of Blower Bluff.

② Also, as a former public official, & as a
taxpayer, I am concerned about using all these
public tax dollars for the primary benefit of
private development (not enough long range benefit to city).

③ Long-term beach nourishment is a losing
battle and very expensive. Every "Norther" will
undo whatever sand has been placed there from
the dredging of Packery Channel.

AA ④ Dr. Orrin Pilkey, internationally respected
Sand-migration expert, when speaking to a group
of local officials here, told us that increased
siltation of the IntraCoastal Canal could be
expected if the Channel is opened. Channel promoters
estimate the cost now to dredge the Channel to
be \$30 Million, with over one million dollars a
year needed to maintain it. But this constant
siltation will require even more money
than that just to maintain it. Dr. Pilkey was
definitely opposed to the project, as I and many
other informed citizens are, also.

Sincerely,
Mary Pat Slavik

(361) 991-9585 412 Palmetto, C.C. TX.
78412

B29-01

B29-02

B29-03

B29-04

<u>Comment</u>	<u>Response</u>
----------------	-----------------

- | | |
|--------|--|
| B29-01 | If a major hurricane were to hit the area, the water would overflow the island, as it has in the past and the existence of the channel would make little difference. Modeling conducted for the USACE indicated no flooding problems from high-tide events. Likewise, when the channel is acting as a conduit and the flow opens out into the large Upper Laguna Madre, the effect of the channel is reduced to non-significance. Brown and Militello (1997) concluded "because of the small cross-sectional area of Packery Channel relative to the cross-sectional area of the Corpus Christi Ship Channel and the volume of the bay system, the opening of Packery Channel is expected to have minimal influence on the bay water level. Simulations indicate that there would not be substantial change in water level variations at the JFK Causeway; therefore, low-lying sections of the roadway are not expected to experience increased incidence or rate of flooding if Packery Channel is re-opened." The Peer Review Panel report (Hayes, van Kreeke, and Dean 1997) agreed with Brown and Militello (1997) relative to flooding inside Corpus Christi Bay during storm events. The channel will not contribute to increased storm damage and erosion. |
| B29-02 | As noted in Section 1 of the DEIS, this project was authorized by Congress. It is a Federal project with a non-Federal cost-sharing sponsor. |
| B29-03 | As noted in Section 1.2.2.4 of the DEIS, modeling for the USACE has indicated that the construction material placed in PA4S can be expected to remain in place for roughly three years. Maintenance material, which would be long-shore drift sand trapped in the channel plus some wind-blown sand, would provide additional nourishment to the beach. |
| B29-04 | The GIWW at the intersection with Packery Channel is almost never maintained, being an area of natural scour. Most of the material trapped in the channel will be sand in Reach 1, which will be placed on the beach. Since modeling has shown that velocities in the channel would not be high, only minimal amounts of soft material should be transported to the GIWW. Fine-grained maintenance material from all of Reach 2 is only expected to be 3,000 cy per year and require five years before enough material accumulates to require maintenance. |

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mailto:mailbox@mcgloinandsween.com
Fax: 361-883-3786
Voice: 361-883-3787

June 21, 2002

Mr. Sam Watson
Department of the Army
Galveston District Corps of Engineers
P. O. Box 1229
Galveston, Texas 77553-1229

Dear Mr. Watson:

I am writing to request a copy of the Draft Environmental Impact Statement for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). Would you please send it to:

Brooke Sween-McGloin
McGloin + Sween
723 North Upper Broadway, Suite 500
Corpus Christi, Texas 78401

Thank you.

Sincerely,

Brooke Sween-McGloin, AIA
Partner

B30-01

<u>Comment</u>	<u>Response</u>
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B30-01	No response necessary. Compact disk sent.
--------	---

Mr. Sam Watson
U.S. Army Corps of Engineers
Galveston District, Planning Division
P.O. Box 1229
Galveston, TX 77553-1229

July 21, 2002

Dear Mr. Watson,

The U.S. Army Corps of Engineers is not specifically charged with dredging a **boat** channel, per se, in Packery Channel. (See Purpose and Need 1.1) It follows then that USACE cannot ultimately be held responsible nor liable for the safety of boats and boaters in Packery Channel. What is the status of the City of Corpus Christi, the other agency funding the project? Or is this going to be "travel at your own risk", even if potential hazards have been documented and not remedied?

The DEIS states that the north jetty from shoreline outward extends approximately 1,430 feet and the south jetty extends approximately 1,478 feet.

The five points below are taken from Packery Channel – Miracle Inlet, 3/17/99, written by Dr. Richard L. Watson, Consulting Engineer, of a previous Packery Channel study.

. "At 1400 feet Packery Channel will have the shortest jetties of any navigation inlet on the Texas coast by nearly 1000 feet.

, Adequate jetties for navigational safety and even a possibility of preventing excessive channel filling will need to be at least 2500 feet long.

. There will be almost no tidal flow to flush sand out of the entrance.

. The authors seriously underestimate the size of the waves which will render navigation dangerous and rapidly fill the inlet.

. I conclude that Packery Channel will be a miracle inlet to have the shortest jetties, no flushing, waves smaller than reality and still have a maintenance cost of less than half that of the cheapest inlet to maintain on the entire Texas coast. It will have to be a miracle inlet to not sink boats and threaten the safety of boaters when it's short jetties will end in heavy surf up to 70 afternoons each year."

* * * * *

My (Hankins) concerns are two-fold. First and foremost, it is for the boaters' safety. For almost 30 years I sailed boats with fixed keels, which are much more stable in high winds with a following sea and choppy water than are smaller powerboats that in the same situations can pitch, yaw, roll, and/or broach. They could miss the small opening, could run into the outside seawall, hit other boats, and/or overturn. This brings up liability, also.

B31-01

B31-02

<u>Comment</u>	<u>Response</u>
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B31-01	Potential hazards have not been documented for the proposed channel by the engineering work and modeling conducted for the USACE.
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B31-02	Extensive engineering studies of waves in the channel, similar to the engineering studies conducted for earlier versions of this project, do not lead to the conditions envisioned by Dr. Watson, but predict a safe inlet.
--------	---

My other concern is as a resident of Corpus Christi. It appears that adding another large cost to remedy this situation would have to come from City funds, if anywhere. These funds would not have been voted on for this project.

Given that USACE has to dredge the channels only to the lengths stated in order to complete its mission, the only alternative is that the City of Corpus Christi will be responsible for safety and liability caused by channel design. I will appreciate documentation on these points.

Respectfully submitted,



Frank D. Hankins
721 Crestview Drive
Corpus Christi, TX 78412

B31-03

<u>Comment</u>	<u>Response</u>
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B31-03	This is not an issue under the purview of NEPA.
--------	---

Following is the statement given by Consulting Geologist Richard L. Watson, Ph.D. before the County Commissioner's Court meeting on Wednesday.

Packery Channel - Miracle Inlet 3/17/99

In order for Packery Channel to succeed as designed it will have to be a miracle inlet.

1. At 1400 ft, Packery Channel will have the shortest jetties of any navigation inlet on the Texas coast by nearly 1000 ft.
2. There will be almost no tidal flow to flush sand out of the entrance.
3. The authors seriously underestimate the size of the waves which will render navigation dangerous and rapidly fill the inlet.
4. The Packery Channel study states that the inlet will be stable. The authors chose to use the Bruun stability index and calculated that a minor bar would form and navigation problems would be minor. Since I corrected their arithmetic, they no longer state the true results of the Bruun calculation. The correct answer states that a very shallow ocean bar will form and navigation will be very difficult.
5. The peer review did not give unqualified support of the study. In fact the peer review found that: the surf sand supply is at least twice that of the feasibility study. The wave data was suspect and more wave data should be collected. There is no natural flushing, and the flushing current described in the feasibility study is not supported by the evidence. The jetties may be too short for safe navigation. The peer review found many other problems as well.

I conclude that Packery Channel will be a miracle inlet to have the shortest jetties, no flushing, waves smaller than reality and still have a maintenance cost of less than half that of the cheapest inlet to maintain on the entire Texas Coast. It will have to be a miracle inlet to not sink boats and threaten the safety of boaters when it's short jetties will end in heavy surf up to 70 afternoons each year.

If 500 Nueces County boats use the miracle inlet, the taxpayer is going to have to pay \$60,000 per boat to build the inlet. Based on realistic, real world dredging costs at other Texas inlets, it will probably cost one million dollars per year to maintain the inlet at a cost of \$2000 per boat for those 500 boats.

This is only the beginning. As soon as it is built, and it becomes obvious to everyone that the jetties are too short and that the bridge is too low for sailboats, big sportfishermen and virtually all commercial boats, the county will be looking for lots more money to extend the jetties and build a high bridge.

Do you really want to spend this much money for an unsafe, high maintenance inlet which will serve only small toy boats in good weather.

Richard L. Watson, Ph.D.



Take a ride to the Dawg House!

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1796 Hwy. 361 Ingleside

775-2049

Pianist Tanya Stambuk to perform at TAMU-CC

The Distinguished Visitor in the Arts series at Texas A&M University-Corpus Christi invites the public and campus community to attend a free performance by pianist Tanya Stambuk.

Stambuk will perform Monday, March 29 at 8 p.m., in the Warren Theatre, Center for the Arts.

Stambuk, a Croatian-American, has been studying piano since the age of six. Stambuk received both her bachelor's and master's degrees at The Juilliard School in New York and completed her doctorate at Rutgers University.

Dr. Jack Best will City Council in A

By Dicky Neely

Former City Council member Dr. Jack Best, a dentist by profession, is running for an At-Large seat on the next city council. He served on the council before, elected twice, for a total of four terms. When Luther Jones was mayor, Best served as Mayor Pro Tem. He ran for mayor twice and for a seat on the County Commissioner's Court twice.

Dr. Best says he is running for the council again because there is a lot of work he would like to continue. "I enjoy helping the city. There are a lot of projects that need to be finished. I want to help finish what I started."

Many of the problems and issues that face the city are unchanged. "We've had the same problems since I was on the council. We wanted to raise the JFK Causeway, fix the seawall and preserve our water supply."

The problems with the dam were not out in the public then and the city council wasn't aware of them either.

The past city councils he served on had a solid list of accomplishments Best says. "The new landfill was a great accomplishment, a place to receive trash until 2050. We guaranteed our water supply with the pipeline. We finished the freeway. We passed the industrial district. The councils I served on were very productive."

Dr. Best says he supports the Borchard plan. "Nobody cares who gets credit. Miracles can happen. If you don't care who gets the credit it probably will happen."

Of all the local problems Dr. Best says the dam repair would be his first priority. "If the

Spring Sports Leagues

Summer Youth
Basketball League

The Corpus Christi Park & Recreation

July 22, 2002

Mr. Sam Watson
U.S. Army Corps of Engineers
Galveston District
Planning Division
P.O. Box 1229
Galveston, TX 77553-1229

Dear Mr. Watson,

My name is Donna LeCompte and my husband and I are stakeholders in the Packery Channel Project (North Padre Island Storm Damage Reduction and Environmental Restoration Project) as we own property on the existing Packery Channel.

After reviewing the Draft Environmental Impact Statement (DEIS) and attending the public hearing, we find little discussion of the shoreline erosion due to changes in tidal level, current velocity, vessel wakes, and storm surge events along the south shoreline west of SH361 **in front of the existing homes.**

As we understand it no bulkheads are proposed for the channel west of the SH361 Bridge, but the DEIS states on page 4.1 that "in the immediate area of the Packery Channel, increase in water velocity and related scour can be expected during a surge event as a consequence of the open channel. Having the channel open can be expected to allow more water through in the initial stage of a surge event, and that higher flow could accelerate scour in the channel." We gather from this statement that the property owners along the south shoreline will initially get an increase in flooding, even more then from the normal storm surge, which will cause increases in area flooding and thus cause more property damage and erosion. **What is going to be done to protect our homes and property before this happens?**

On page 4-29 "URS (2002) used USACE methodology to estimate boat-generated waves to be 2 foot high in Reach 1 and 1 foot high in Reach 2. URS concluded that if the speed of crafts is controlled to below 4 Knots, the boat-generated waves would be minimal. This is particularly important from stations 90 + 00 to 132 + 25 to preserve tidal flats and marsh areas. **If boat traffic velocities can not be regulated, URS recommends shoreline protection for the northern and southern shorelines.**" We believe that we need a bulkhead in front of our homes along the above mentioned stations as a "No Wake Zone" currently exists, but has never been properly enforced. **Who will be in charge of regulating the "No Wake Zone" and how do they intend to enforce it?**

On page 4-31 "Shoreline erosion may differ from existing conditions due to changes in tidal level, current velocity, vessel wakes, and storm surge events. URS (2002) modeling

B32-01

B32-02

<u>Comment</u>	<u>Response</u>
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- | | |
|--------|---|
| B32-01 | <p>This paragraph in the DEIS was in error and has been revised. Surge was evaluated by URS (URS, 2002) for several scenarios, including the 10-year recurrence storm, the 50-year recurrence storm, a high-flow storm, and low-flow summer condition. The model used was the one-dimensional HEC-RAS model, which was calibrated to the data from the two-dimensional model used by Brown and Militello (1997). Data for the 10-year storm and the 50-year storm were taken from a flood insurance study for Nueces County by FEMA (FEMA, 1992) and data for the other two were from typical summer low-flow conditions and a tropical storm of unknown recurrence from Brown and Militello (1997). Results included the water surface and average channel velocity at numerous locations along Packery Channel. Data from near the intersection of Packery Channel and the GIWW (Station 12+58, see Figure 1-3 of the FEIS) are as follows: summer low-flow, water surface = 0.11', velocity = 0.08 fps; 10-year storm, water surface = 2.2', velocity = 0.31 fps; 50-year storm, surface 8.32', velocity, 0.08 fps; high-flow storm, water surface = 2.1', velocity, 0.22 fps. The counter-intuitive velocity results for the 10-year and 50-year storms is because the island is overtopped and the channel is just a deeper part of the island and is no longer a significant conduit. Thus, when significant flow occurs, the channel makes little difference. Likewise, when the channel is acting as a conduit and the flow opens out into the large Upper Laguna Madre, the effect of the channel is reduced to non-significance. Brown and Militello (1997) concluded "because of the small cross-sectional area of Packery Channel relative to the cross-sectional area of the Corpus Christi Ship Channel and the volume of the bay system, the opening of Packery Channel is expected to have minimal influence on the bay water level. Simulations indicate that there would not be substantial change in water level variations at the JFK Causeway; therefore, low-lying sections of the roadway are not expected to experience increased incidence or rate of flooding if Packery Channel is re-opened." The Peer Review Panel report (Hayes, van Kreeke, and Dean 1997) agreed with Brown and Militello (1997) relative to flooding inside Corpus Christi Bay during storm events. The channel will not contribute to increased storm damage and erosion.</p> |
| B32-02 | <p>As noted in Section 4.4.1, a No Wake Zone will be instituted and enforced. The City has obligated itself to use full-time Park Police to enforce the No Wake Zone. Because of this, vessel wakes were not investigated.</p> |

studies . . . indicated that the shorelines of Packery County Park (southern shoreline of channel) and MBHC (northern shoreline of channel) were susceptible to erosion from boat-generated waves if boat speeds were not controlled (less than 4 Knots)." It states that "however, wave barriers are not considered for either side as the construction would cause more damage than the protection they would provide." That is not the case along the southern side of the channel in front of the existing homes. Wave barriers would provide protection to this area without causing undue harm to the environment.

The North Padre Island Storm Damage Reduction and Environmental Restoration Project continues to be very unsettling for many of the residents of the Packery Channel Neighborhood as we believe our area has not been adequately examined in the big picture of the Packery Channel Project. We want to know that our homes, our property, and our neighborhood will be protected.

We thank you for your time. If we can be of any assistance to you on this matter, please contact us.

Sincerely,

Dr. and Mrs. Michael LeCompte
14338 Playa Del Rey
Corpus Christi, TX 78418
361-949-1430

B32-03

<u>Comment</u>	<u>Response</u>
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B32-03	<p>For areas west of the SH 361 bridge, tidal level and storm surge events will not significantly change from the current conditions because the Corpus Christi Ship Channel has a significantly greater influence on the water level. Thus, erosion associated with water level is not anticipated. Current velocities were investigated for the channel extended the work performed by Brown and Militello (1997). URS (2002) showed that the velocities in channel west of SH 361 in front of the neighborhood were below 2.0 fps during storm normal conditions. At velocities below 2.0 fps, sandy soils are not susceptible to erosion and do not require armoring. Therefore, beyond the constriction imposed by the bridge, URS determined that no erosion control is necessary and none is planned.</p>
--------	--

July 25, 2002

To whom it may concern,

My name is Bill Singerland. I live and teach in Port Aransas, Texas. I grew up in Corpus Christi. I am very familiar with the area that has been proposed for a man-made channel and future development at Packery Channel.

At first, the idea of an additional pass for use by boats and movement of organisms and water sounds very favorable. However, it is not worth the loss of wetlands and pristine beauty in the area.

This is an area where my marine science class in high school observed mud flats, sea grass beds, and Spartina marshes. Corpus Christi has always put a high value on tourism and environment. Here is an area utilized by fishermen, students, and bird watchers. The wetlands are essential for flood control, and homes to young fish and shrimp which support a fishery.

I drive by this area at least four times a week. The number of birds utilizing this area all year and especially in winter is incredible. The piping plover, an endangered species, uses this habitat. Other wonderful residents include black skimmers, brown pelicans, reddish egrets, and stilts.

The Packery Channel has been opened due to nature several times but it has been closed for decades. The geology of the area will not allow the pass to stay open. And the proposed amount of money to keep the channel open is a very low estimate. I remember when the Fish Pass was constructed. It was silted up within a year, and now it is an area of tidal marsh.

The proposed developed area will only benefit a few and only provide a limited amount of jobs. Other projects in the city will provide more jobs and trickle down economics to the community.

Please consider all these points when deciding on the Packery Channel project and please reject the proposal.

I thank you for your time in reading the letter and having the public hearing.

Sincerely,



Bill Singerland

P O Box 1285

Port Aransas, Tx 78373

B33-01

B33-02

<u>Comment</u>	<u>Response</u>
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B33-01	Impacts to avifauna are discussed in Section 4.5.2. Impacts are expected to be minimal. A non-jeopardy BO from the FWS has been prepared and is included in the FEIS.
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B33-02	Engineering studies have shown that the channel can be kept open with maintenance dredging, like almost all other channels along the Texas coast.
--------	---

July 24, 2002

U.S. Corps of Engineers
Galveston District
P.O. Box 1229
Galveston, TX 77553

Re: Packery Channel Public Comment

To Whom It May Concern:

For the record I am not opposed to the dredging of the Packery Channel. I think that development would benefit and diversify the economy of the Corpus Christi area. However, I am concerned in the role that the U.S. Corps of Engineers is playing in this development. As I understand it, the Corps function is to study the hydrological impacts of and issue permits for construction projects involving bodies of water. Based on the July 19, 2002 article in the Corpus Christi Caller-Times it sounds like the Corps is a partner in a private development deal. Is this appropriate? Is this common for the Corps to do such dredging? Why is the Corps dredging the channel and not the developer of the resort? Why should this be a public project?

Why are federal, state and local governments subsidizing a private commercial development? I am most certainly against public subsidization and patronage of such development schemes. Government funding of the Packery Channel dredging offers this developer an unfair advantage over competitors. Developers already get too many breaks and sweet deals as it is. I am quite certain that the developer would not be able to pull this off these plans without public assistance.

I hope you are able to send me some literature or other materials regarding the role of the Corps of Engineers with regards to its jurisdiction and its role in development. A lot of my questions are based on my own ignorance of the Corps. I would love to be educated.

Sincerely,



Joel Sergio Chapa
7101 Guadalupe #204
Austin, TX 78752

B34-01

B34-02

<u>Comment</u>	<u>Response</u>
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B34-01	This is a Federal project, authorized by Congress, with a cost-share non-Federal sponsor. The USACE has the responsibility to implement the project.
B34-02	The Galveston District website (www.swg.usace.army.mil) lists the various functions of the District.

July 24, 2002

U.S. Army Corps of Engineers
Galveston District
P.O. BX 1229
Galveston, TX 77553

Gentlemen and Ladies:

SUBJECT: PACKERY CHANNEL

1) As a waterfront property owner I have serious concerns about the proposed dredging of the Packery Channel. I live in Flour Bluff between the Causeway and the Barney Davis power plant. Our backyard is the Laguna Madre.

2) I would like to know what data the Corps has on potential changes in tidal flows (lunar and storm) that will result from the dredging of the Packery. **I would like to be provided with copies of all reports, studies etc. that are related to this issue of tidal flow changes.**

3) This is not a casual request for information to satisfy my curiosity. This is a request for information in order to plan for potential flooding, increased damages during storms, and the possible need to prepare for erosion and other future problems. I am not a scientist or engineer. I can, however predict that cutting an Ocean pass twenty-odd miles closer to my house will cause tidal changes. I am not totally adverse to the plan, but I am very concerned about the effect it will have on my property and my ability to use it.

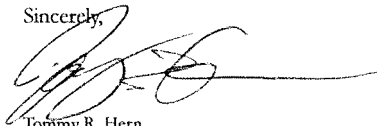
4) Are there any plans to compensate owners who stand to lose? Will I be eligible for free flood insurance?

5) Will the dredge material be available to replenish my property if erosion becomes a factor?

6) What changes will this have on wetlands and bird habitat on the Encinal Peninsula?

7) Are the reports, data etc. available on the Internet?

Sincerely,



Tommy R. Hern
July 24, 2002

B35-01

B35-02

B35-03

B35-04

B35-05

<u>Comment</u>	<u>Response</u>
B35-01	Some studies are included in Section 4.2 of the EIS. Copies of other studies performed by URS for the USACE can be found on the District website (www.swg.usace.army.mil).
B35-02	No.
B35-03	Engineering studies indicate that erosion should not be a problem. All maintenance material will either be used for beach nourishment or will be placed in the MMPA, an upland confined PA.
B35-04	There will be no discernable impacts on the Encinal Peninsula.
B35-05	Please see the District website (www.swg.usace.army.mil) for all reports

950 Oriole Street
Corpus Christi, TX 78418

July 25, 2002

Department of the Army
Corps of Engineers
P O Box 1229
Galveston, TX 77553-1229

RE: DEIS N Padre Island Storm Damage Reduction
& Environmental Restoration Project 106-53

Gentlemen:

As I was unable to attend the recent hearing, I am submitting some questions for you, along with general comments, for inclusion in your final report.

1. How can anyone justify spending additional millions of dollars on a project that although it may not have any serious detrimental effect on the environment would not have any positive effects either (in other words, "benign")?
2. How much in taxpayer money has been spent on studies connected with Packery Channel?
3. If this project is supposed to "create jobs" which is what the people of Corpus Christi have been led to believe, why is it being presented under the guise of "storm damage reduction and environmental Restoration"?
4. There is a seawall next to the area where Packery Channel is to be opened to the Gulf. Seawalls are usually for the purpose of keeping water OUT. A channel next to the seawall would let water flow IN. Is there some scientific engineering theory that makes this scenario logical? (To the non-engineer this scenario appears just plain stupid.)
5. I had understood that cost estimates on projects of this type must include the cost of maintenance for a period of 50 years. What are the annual maintenance costs, which I understand must be paid by the city? Have these cost obligations been made clear to the City of Corpus Christi and to the public? And what happens if the T.I.F. financing is not sufficient to take care of these costs?
6. If this project is to be such an advantage to the people, particularly of Padre Island, why isn't the channel being cut at Corpus Christi Pass or the old Fish Pass (leading into the deeper waters of Corpus Christi Bay and closer to the larger population areas of the city and the Naval Air Station)? Many of the people of Corpus Christi have been hoodwinked into thinking Packery Channel is the ONLY loca-

B36-01

B36-02

B36-03

B36-04

B36-05

B36-06

<u>Comment</u>	<u>Response</u>
B36-01	The project has been authorized by Congress.
B36-02	Packery Channel has been under study for a number of years, and the Corps does not have information on all money spent on the project by the various local sponsors prior to enactment of WRDA 1999 (PL 106-53). The current project is funded by WRDA 1999 at a total estimated cost of \$30,000,000, with an estimated Federal cost of \$19,500,000 and an estimated non-Federal cost of \$10,500,000.
B36-03	The project purpose was established by Congress in WRDA 1999 (PL 106-53)
B36-04	There is a seawall along the Gulf beach. There is a flood control structure north of Padre Isles. However, the Inner basin and Padre Isles are presently connected to the Upper Laguna Madre and, thus, ultimately to the Gulf through the existing Packery Channel.
B36-05	The City, as non-Federal sponsor, is cognizant of all cost estimates for the project, including those for maintenance for the 50-year project life. If the T.I.F. financing is insufficient, the City is still obligated to its share of the cost for the project and for maintaining the channel.
B36-06	The alternatives analysis (Section 2 of the FEIS) has been expanded to include the Fish Pass. However, based on impacts to various habitats, the intent of Congress to reduce erosion at the Seawall, and other factors discussed in Section 2, the Fish Pass alternative and an alternative south of Packery Channel were eliminated from detailed consideration in the FEIS.

tion, whereas this location actually prohibits use by larger boats, suitable for use in the Gulf, but too big to go under the low bridge leading to the cut at Packery. Obviously, this means if you want a large boat, you would have to buy property at Lake Padre if you want to use the Packery outlet to the Gulf.

7. (This question is not about the EIS, but is for the persons dragging you into this fiasco.) Why can't the people touting the Packery Proposal be honest about this proposal and describe it for what it really is -- an entrance to Lake Padre for the benefit of property owners in that area?

B36-07

8. If further development (more hotels, etc.) is desired, what is wrong with the top of the seawall and beachfront property on either side of the seawall. Why could not a T.I.F. be used for development of this property?

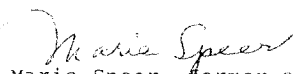
B36-08

9. What consideration has been given to the economic impact or convenience of the thousands of people who flock to the beach now, just north of the seawall? (Packery Channel would sacrifice the enjoyment of thousands of beachgoers for a relatively small number of property owners at Lake Padre.)

B36-09

Yes, the writer of this letter is the same person who published the local newspapers for this area for the past 25 years, so I witnessed first hand the shenanigans which have been going on. I have now sold the papers, so what the present owner says or does is not my business. This letter is from me, personally. I am sorry I was not able to attend the recent hearing, but I was in California visiting family.

I wish to thank your staff for the cooperation I have received during the past years; always accurate and timely. During those 25 years I have published many articles about Packery Channel, many quoting the Texas Attorney General and government agencies, as well as your office. The public has a right to know the truth, and that is what I have given them as well as opinions from the readers -- but no fairy tales about the riches to come to this area or the tremendous environmental benefits (your report thoroughly answered the environmental issues, but unfortunately only time, not pie-in-the-sky economic so-called "studies" will furnish the true answers to the economic benefits).


Marie Speer, former editor/publisher
Flour Bluff Sun, Coastal Bend Sun
and Seaside Sun

<u>Comment</u>	<u>Response</u>
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B36-07	This comment is not applicable to the Federal project.
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B36-08	This issue is not applicable to the Federal project.
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B36-09	Potential impacts to the beach north of Packery Channel as a result of this project would be temporary, occurring primarily during construction and maintenance of the channel. PA4N would only be used if net long-shore transport causes erosion along this part of the beach. Long-term impacts would be beneficial to the beach, replenishing lost beach materials. These impacts are thoroughly discussed in the FEIS.
--------	---



Audubon Outdoor Club of Corpus Christi, Inc.

"Organized for the Observation and Conservation of Wildlife"

07/27/02

Sam Watson
U S. Army Corps of Engineers
Galveston District
Planning Division
Box 1229
Galveston, Tx. 77553-1229

Re: Packery Channel Environmental Impact Study

Dear Mr. Watson,

As President of the Audubon Outdoor Club of Corpus Christi, Inc., I represent an organization of over 300 members. This organization owns a preponderance of the property in the residential area known as Packery - the property is designated as a Nature Preserve.

Writing for this organization, I would like to make the following comments in regard to the Environmental Impact Statement for the North Padre Island Storm Damage Reduction and Environmental Restoration Project:

1. Storm Damage Protection : No study given or was incomplete on the effect of storm and/or tidal damage to the Molly Beatie Sanctuary, and the Piping Plover habitat.
2. What effort has been made to assure the protection of the dunes due to the changes in wave action and tidal surges.
3. Maintenance Dredge: Although the original site of the placement dredge at the Packery Point Park was totally unacceptable, the new site selected is equally unacceptable - it is a known bird rookery.
4. No study mentioned as to the effect of this project on the habitat of the Snowy Plover.

Thank you for allowing this comment.

Sincerely,

Leah Pummill
President
Audubon Outdoor Club of
Corpus Christi, Inc

B37-01

B37-02

B37-03

B37-04

<u>Comment</u>	<u>Response</u>
B37-01	At the request of the FWS, TPWD, and the GLO, additional modeling runs have been conducted and the results are discussed in Section 4.4.1 of the FEIS.
B37-02	No changes are expected. According to modeling conducted with the TxBLEND model developed by the Texas Water Development Board, changes in the tidal range are expected to decrease in and near Packery Channel. The sides of the channel in Reach 1 (the channel east of SH 361) will be armored and there will be an enforced No Wake Zone in Reach 2. There will be mitigation for actual dune impacts (Please see the City's GLO lease in Appendix A).
B37-03	The new proposed MMPA was not noted as a rookery by FWS, GLO, or TPWD personnel during discussions with them relative to use of the MMPA nor did a pedestrian survey of the site and several investigations of the channel area by boat indicate that the island is a rookery. Impacts to the vegetation at the site are included in the FEIS.
B37-04	The snowy plover is not considered endangered or threatened by either the FWS or TPWD. Therefore, it is lumped with the other shorebirds. Shorebird habitat is discussed generally in Section 3.5.2.

① JULY 29 2002

MARYLYN UHRICH,

I ATTENDED AND SPOKE AT THE PUBLIC MEETING ON PACKERY HELD IN CORPUS CHRISTI, TX AS I STATED THEN I HAVE BEEN INVOLVED IN THIS PROJECT FOR OVER TWENTY YEARS AND I HAVE DONE MY HOMEWORK. AS I SPOKE I GOT JUST A BIT OFF THE ISSUE OF THE ENVIRONMENTAL ISSUE. I FIND IT HARD TO BELIEVE OPENING A PASS LETTING SO CALLED STORM WATER RUSH THROUGH FLOODING THE BAY AREA. THE NAME NORTH PADRE ISLAND STORM DAMAGE REDUCTION AND ENVIRONMENTAL RESTORATION PROJECT. THE PLAN IS TO DIG THE PACKERY CHANNEL PLACE THE SAND OR WHATEVER THEY DIG UP IN FRONT OF THE SEAWALL IN FRONT OF THE HOTELS WHICH BY THE WAY WAS BUILT ON TOP OF THE DUNE LINE. ONE COULD QUESTION THE LEGALITY OF THE HOTELS AND SEAWALL. WE ARE LOSING THREE TO FIVE YARDS OF BEACH EACH YEAR NOT JUST IN FRONT OF THE SEAWALL BUT THE WHOLE BEACH LINE MOVING WESTWARD ALL THE DIGGING AND FILLING WILL NOT STOP THE WIND AND WAVE ACTION. I PARKED AT BOB HALL FISHING PIER THE ONLY THING KEEPING THE SAND FROM BLOWING AWAY IS THE PARKING LOT AND ROADWAY.

B38-01

B38-02

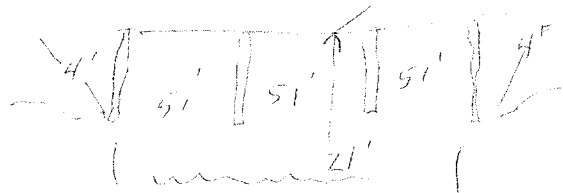
B38-03

<u>Comment</u>	<u>Response</u>
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- | | |
|--------|---|
| B38-01 | Engineering studies show that the water will not rush through the channel and flood the bay. Expected salinity and tidal amplitude changes, with the project, are presented in the FEIS. An analysis of flow, by URS for the USACE, shows moderate flows under normal circumstances. As noted in Section 5.4.3.5, with higher water levels such as occur with a hurricane surge, the island will be overtopped and Packery Channel will have no discernable impact on water movement. |
| B38-02 | Only sand will be placed in PAs 4S and 4N, as is noted in Section 1.2.2.4.. |
| B38-03 | The channel will capture some of the blowing sand and it will be returned to the beach during maintenance. |

(2)

PEOPLE STANDING AT LEAST ONE HUNDRED
YARDS IN A CALM DEEP WATER THEIR HEADS
LEVEL WITH THE ROADWAY IT NOT HARD TO
ESTIMATE THE AMOUNT OF SAND THAT
KEEP ERODING. ON A MODERATE WINDY DAY
YOU CAN SEE A CONTINUOUS FLOW OF SAND
BLOWING ACROSS THE ROADWAY. AS I
STATED J.P. LUBY STORM WASH OUT IS NOT
PACKERY WE GET "LIED" TO ON EVERY
ASPECT OF THIS PROJECT. LENGTH OF
DIG 3.5 MILES I MEASURED THIS DISTANCE
FROM THE INTER COASTAL TO THE WATER
EDGE OF THE GULF ITS 6.5 TO 7 MILE
2.5 EAST OF BRIDGE 4.0 WEST OF BRIDGE.
TO GET THE BOATERS SUPPORT FROM THE
FOLKS LIVING ON THE ISLAND IT WAS
FLAGGED AS A BEAT PASS I MEASURE
THE UNDER PASS OF THE BRIDGE, I FIND
IT HARD TO BELIEVE THEY WOULD OK
A NAVIGATION WATER WAY WITHIN THE
CONFINDS. BRIDGE SUPPORTS
AS IS NOW



B38-04

B38-05

<u>Comment</u>	<u>Response</u>
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B38-04	As an examination of Figure 1-3 will show, Packery Channel intersects the GIWW at Station 0+00 and the beach line is at roughly Station 182+00, a distance of 18,200 feet or 3.45 miles.
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B38-05	This Federal project is authorized as a storm damage reduction and environmental restoration project, not as a navigation project. The resulting channel will be utilized by recreational boaters, and can accommodate boats up to roughly 40 feet in length, with a draft of 4 feet. Such a vessel should encounter no problems navigating the bridge opening as shown on your drawing.
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3

VOTING ON THE SO CALLED PACKER CHANNEL
WHAT THE VOTER WERE ASK TO VOTE
ON, THE TAX INCREMENT ZONE THE FINANCING
OF THE PROJECT, NOT THE PACKERY CHANNEL
BUT THE BALLOT PUT ALL THE GOODIES
THE VOTERS WOULD RECEIVED FISHING PEARLS
BATH HOUSES WALK WAY YOU NAME IT. THIS
FEASO WAS PUSHED BY THE DEVELOPERS FOR
ONE PURPOSE MONEY, MONEY. EVER CORNER
OF THIS CITY HAD A SIGN VOTE PACKERY
CHANNEL AT THE COST OF OVER \$385,000
DOLLARS. AS USUAL THE CITIZEN OF THIS
CITY WERE SOLD A PIG IN A POLK-
WITH THE LENGTH OFF THE PACKERY CHANNEL
NOT 3.5 MILES BUT 6.5 MILES 30 MILLION
IS NOT GOING COVER THE FINAL COST,
20 MILLION FEDERAL TAX MONEYS
10 MILLION CITY BOND MONEY WHEN THE
PROJECT CRATER WITH BUT THE TAXPAYERS
OF THIS CITY ARE LEFT WITH THE BILL
THANK YOU!

RAYMOND F. HASKEE
1813 WALLACE AVE
CORPUS CHRISTI, TX. 78412

B38-06

<u>Comment</u>	<u>Response</u>
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B38-06	Please see response to Comment B38-04.
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Watson, Sam SWG

From: Murphy, Carolyn E SWG
Sent: Tuesday, July 30, 2002 9:00 AM
To: Watson, Sam SWG
Subject: FW: Packery Channel Project Draft EIS
Importance: High

-----Original Message-----

From: NDEVLIN [mailto:ndevlin@stx.rr.com]
Sent: Monday, July 29, 2002 11:36 PM
To: Murphy, Carolyn E
Subject: Packery Channel Project Draft EIS
Importance: High

I read the draft Environmental Impact Statement (EIS) of the North Padre Island Storm Damage Reduction and Environmental Restoration Project [in] Nueces County, Texas and found several of the conclusions reached to be unsubstantiated or possibly based on flawed assumptions. I do not believe that the EIS data supports the conclusion that the project will not harm the coastal habitat that currently exists, nor do I believe that the data supports the conclusion that the project may be beneficial to the environment. Therefore, I am against the Packery Channel project as it is currently envisioned.

Please print my statement and include it as an official part of the comments on the project.

Sincerely,

Nancy J. Devlin
North Padre Island resident
15357 Mutiny Court
Corpus Christi, Texas 78418-6342

B39-01

B39-02

7/30/2002

<u>Comment</u>	<u>Response</u>
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- | | |
|--------|--|
| B39-01 | The DEIS does not state that the project would have no impacts and that it is beneficial to the coastal environment. Instead, it lists the impacts to the various habitats, quantifying them where possible, in Section 4. |
| B39-02 | The statement is included. |

Watson, Sam SWG

From: Murphy, Carolyn E SWG
Sent: Tuesday, July 30, 2002 9:05 AM
To: Watson, Sam SWG
Subject: FW: Packery Channel Project EIS

-----Original Message-----

From: txbufflehead@Care2.com [mailto:txbufflehead@Care2.com]
Sent: Monday, July 29, 2002 11:47 PM
To: Murphy, Carolyn E
Subject: Packery Channel Project EIS

I read the draft Environmental Impact Statement (EIS) of the North Padre Island Storm Damage Reduction and Environmental Restoration Project [in] Nueces County, Texas and found several of the conclusions reached to be unsubstantiated or possibly based on flawed assumptions. I do not believe that the EIS data supports the conclusion that the project will not harm the coastal habitat that currently exists, nor do I believe that the data supports the conclusion that the project may be beneficial to the environment. I think that the birds and their habitat, especially that for the piping plover as well as other birds, will suffer greatly from the construction, the removal of habitat, and the addition of substrate. Therefore, I am against the Packery Channel project as it is currently envisioned.

Please print my statement and include it as an official part of the comments on the project.

Margaret J. DiClemente
North Padre Island resident
15357 Mutiny Court
Corpus Christi, Texas 78418-6342

Will antibiotics work in 20 years?
End the misuse of Antibiotics:
<http://www.care2.com/go/z/1425>

B40-01

B40-02

<u>Comment</u>	<u>Response</u>
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- | | |
|--------|---|
| B40-01 | The DEIS does not state that the project would have no impacts and that it is beneficial to the coastal environment. Instead, it lists the impacts to the various habitats, quantifying them where possible, in Section 4. One and one-half acres of beach will be permanently removed by the channel cut and jetty construction. The "addition of substrate" is beach nourishment, protecting the beach where there is presently erosion, by replenishing the sand on the beach. A complete discussion of impacts to the piping plover is included in Section 4.6.2 of the FEIS and in the Revised BA. The FWS has prepared a BO, which is appended to the FEIS. |
| B40-02 | The statement is included. |

U.S. Army Corps of Engineers
Galveston District
PO Box 1229
Galveston, Texas 77553-1229
Attn: Lloyd H. Saunders, Ph.D.

Re: Comments on Draft Environmental Impact Statement

Dear Mr. Saunders:

On behalf of the Padre Island Business Association, we would like to thank the Corps of Engineers for the opportunity to review the Draft Environmental Impact Statement (DEIS) for North Padre Island Storm Damage Reduction and Environmental Restoration Project and provide public comment.

The Padre Island Business Association has actively followed the progression of this project for many years and looks forward to seeing the project brought to fruition. We were particularly pleased to see in the DEIS that no significant environmental findings were found

Area planners, engineers, and environmental scientists have watched diligently over the years to adequately plan this project so that impacts to the environment would be minimized. It is our strong belief from review of previous studies as well as the DEIS that there will be a net benefit to the environment once construction activities are complete and the project is operational.

We encourage the Corps of Engineers and our local area project sponsor to proceed expeditiously with this project and once again appreciate very much the opportunity to comment on such an important public project.

Sincerely,

Jim Philomeno
Padre Island Business Association Board Member

B41-01

Comment

Response

B41-01

Thank you for your comments

To: Lloyd H. Saunders, Ph.D.
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX. 77553-1229

I would like to voice my support of the Packery Channel Project. My husband and I have lived on Padre Island since 1984. The quality of the water in the canal bulk-headed subdivision would be greatly improved with the fresh seawater thru Packery Channel to the Gulf of Mexico.

I also believe that the fishing would be greatly enhanced for the upper Laguna Madre. The Packery Channel in conjunction with the raising of the JFK causeway will improve water quality and fishing for the entire area.

Thank you for your attention to this matter.

Sincerely,

Carol Collier

Carol Burton Collier
15806 Punta Espada
Corpus Christi, TX. 78418

361.949.8316 Home Phone

B42-01

Comment

Response

B42-01

Thank you for your comment

Lloyd H. Saunders, Ph.D.
Galveston District, Corps of Engineers
PO Box 1229
Galveston, Texas 77553-1229

RE: Packery Channel Project in Corpus Christi

Dear Sir:

We are writing to express our support of the Packery Channel Project in the Corpus Christi area. This proposed project will have three significant impacts.


First, the project will renourish the beach in front of the seawall on Padre Island helping to stabilize the existing structure and maintain critical storm surge protection. As residents of Padre Island, this is very important to us and our neighbors.

Secondly, the project will improve the water circulation in both the south end of Corpus Christi Bay and the Padre Isles area. Water quality will be enhanced from the north end of the Laguna Madre to the south end of Corpus Christi Bay.

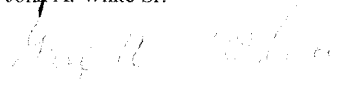
Thirdly, there will be a strong economical benefit to the city and residents because of a positive impact on property values and future possible development on the island.

In closing, we wish to again indicate our strong support for this project and recommend its implementation.

Thanking you in advance for your consideration,



John A. White Sr.



Gaye A. White
13922 Primavera Drive
Corpus Christi, Texas 78418
(361)949-0154

B43-01

<u>Comment</u>	<u>Response</u>
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B43-01	Thank you for your comments
--------	-----------------------------

ASSET DEVELOPMENT CORPORATION
14646 Compass Street – Suite 6
Corpus Christi, Tx 78418
Phone 361-949-7151 Fax 361-949-7151

July 17, 2002

Lloyd H. Saunders, Ph. D.
Galveston District, Corps of Engineers
P O Box 1229
Galveston, Texas 77553-1229

Dear Dr. Saunders:

I would like to offer my support for Packery Channel. However, I am requesting that the eastern reach and jetties be shifted south 200' with the same directional alignment. My reasons are explained below.

Moving Packery Channel's eastern section further south is important for three primary reasons.

1) **Additional protection of the southern end of the existing seawall will be achieved**

The primary purpose of the Packery Channel Project is the protection of the existing seawall and storm damage reduction. The greatest exposure for damage to the seawall is at the southern end. All of the studies indicate that as erosion takes place it reaches the southern end of the seawall first. Accordingly, the further south the beach is re-nourished the longer the protection provided by re-nourishment will exist. It is therefore fundamentally in the best interest of the primary purpose of the project to start re-nourishment 200 feet further south thus ending re-nourishment 200 feet further south. This extends the useful life of the re-nourishment project.

2) **Disturbance of critical dune fields will be minimized.**

The current alignment of the eastern reach and jetties passes directly through a large existing set of dunes. Moving the centerline of the eastern reach and jetties 200 feet south avoids this dune field. This also means that there is 200 feet of habitat left in its natural state on the north side. In as much as all of the south side will be disturbed in either case the natural habitat is advantaged only on the north side.

B44-01

Comment

Response

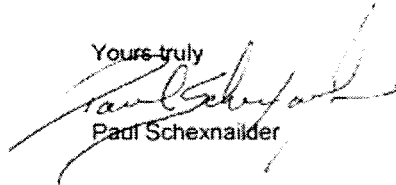
B44-01

Thank you for your comments.

3) Sand stored adjacent to the Channel will be minimized.

During a severe storm event sand stored adjacent to the channel is most likely to be deposited in the channel. This has the potential to increase the amount of repair and maintenance following such storms. Reducing the amount of stored material on the south side of the channel will help reduce this possibility. The quantity of sand to be stored on the south side currently would substantially fill the eastern reach of the channel.

Yours truly

A handwritten signature in dark ink, appearing to read "Paul Schexnailder", is written over the typed name.

Paul Schexnailder

APPENDIX C-2

AGENCY COMMENTS AND RESPONSES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

JUL 29 2002

Colonel Leonard D. Waterworth
District Engineer
Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Dear Colonel Waterworth:

In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Environmental Impact Statement (DEIS) for the proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project, Nueces County, Texas.

EPA rates the DEIS as "EC-2," i.e., EPA has "**Environmental Concerns and Requests Additional Information in the Final EIS (FEIS).**" EPA has identified environmental concerns and informational needs to be included in the FEIS to complement and to more fully insure compliance with the requirements of NEPA and the CEQ regulations. Areas requiring additional information or clarification include: project purpose and need, direct and secondary impacts of increased boater recreation and increased economic development, and overall project economic cost-benefit analysis.

Our classification will be published in the Federal Register according to our responsibility under Section 309 of the Clean Air Act to inform the public of our views on proposed Federal actions. Detailed comments are enclosed with this letter, which more clearly identify our concerns and the informational needs requested for incorporation into the FEIS. Additional comments are being developed by an associate reviewer and will be provided soon. If you have any questions, please contact Mike Jansky of my staff at 214-665-7451 for assistance.

EPA appreciates the opportunity to review the DEIS. Please send our office five copies of the FEIS when it is sent to the Office of Federal Activities, EPA (Mail Code 2252A), Ariel Rios Building, 1200 Pennsylvania Ave, N.W., Washington, D.C. 20460.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Robert D. Lawrence".

Robert D. Lawrence, Chief
Office of Planning and
Coordination (6EN-XP)

Enclosure

**DETAILED COMMENTS
ON THE
CORPS OF ENGINEERS'
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR THE
NORTH PADRE ISLAND STORM DAMAGE REDUCTION AND
ENVIRONMENTAL RESTORATION PROJECT**

BACKGROUND

The U.S. Army Corps of Engineers, Galveston District, has been directed by the U.S. Congress to carry out a storm damage reduction and environmental restoration project at North Padre Island, Nueces County, Texas. Pursuant to this directive, an Environmental Impact Statement has been prepared to address project impacts. The local sponsor is the City of Corpus Christi. The project consists of reconstruction of an existing 2.6 mile channel and a new 0.9 mile channel extension between the Laguna Madre and the Gulf of Mexico across North Padre Island referred to as Packery Channel. In addition to opening Packery Channel, the project will provide two impermeable rock jetties at the Gulf end of the Channel and deepen and widen the existing channel and Inner Basin. Packery Channel follows the course of a historic pass between the Gulf of Mexico and the Laguna Madre. The project also involves the establishment of four dredge material placement areas, including the use of some new work material for beach nourishment to counter the effects of wave erosion. EPA's comments are as follows:

PROJECT PURPOSE AND NEED CLARIFICATION

The DEIS title indicates that the project purpose is to reduce storm damage to North Padre Island and to restore environmental conditions, which are defined as "reducing hypersaline conditions in the Laguna Madre." The document does not define or assess the storm damage issue nor does it make a case for significant beneficial impacts on the salinity regime in Laguna Madre. Rather, the DEIS is focused on another purpose, that of enlarging and extending the Packery Channel, creating a pass to the Gulf of Mexico from the Laguna Madre. The purpose for creating the pass seems to be to provide increased recreational power boat opportunities and to stimulate economic development on North Padre Island, yet the DEIS does not include analyses of these goals. Please discuss this concern fully in the Final EIS (FEIS).

The first proposed purpose is to reduce storm damage. It may be inferred that this damage is defined as a need for beach nourishment on the Gulf-side of Padre Island, south of Packery Channel. However, this condition is not discussed in detail. No information is provided to indicate whether the increased water exchange with the Gulf could increase the potential for storm surge damage. Information should also be provided which clarifies the nature and extent of historic and recent beach erosion problems in this site-specific area, in the context of beach erosion in the larger North Padre Island region. Once a status and trends analysis is developed and potential causes identified, a range of options should be presented and analyzed. The DEIS only examines the option of piping sand across the jetties installed to protect the Gulf opening of the new channel cut. This is more accurately a project mitigation measure for the jetty construction, which is expected to block longshore sediment drift. This concern should be fully discussed in the FEIS.

In regards to jetty construction, the effect of the jetties is not thoroughly discussed. The DEIS states that monitoring should be scheduled to determine the extent of erosion or accretion "in the vicinity of the jetty". The effect of jetties on longshore currents and sediment transport might be felt several miles from the jetties. Thus, the monitoring area should be extended to cover the entire area that may be affected. Please discuss this concern fully in the FEIS.

The DEIS states that new work material from the proposed channel would be used for beach nourishment and to provide storm damage protection. But how this new material will reduce existing erosion or storm damage is not discussed. The benefits from new work material could be temporary. If this project is supposed to have long term benefits, storm damage scenarios (with and without project) using just maintenance material should be conducted. Furthermore, this should be presented as a beneficial use of dredged material and should not be construed as a major project purpose. Please discuss this concern fully in the FEIS.

The second proposed project purpose stated in the DEIS is to reduce the hypersaline conditions of the Laguna Madre. The document concludes that opening the Packery Channel to the Gulf could result in small, localized effects, which could increase bay salinity by increasing tidal exchange with the Gulf. The Habitat Evaluation Procedure (HEP) analysis found that gains in habitat occur under high salinity conditions, once every five years, but slight habitat losses are predicted under average annual conditions. Thus, a major project purpose appears to be unmet by the proposed alternative. Please clarify this concern in the FEIS.

UNSTATED PROJECT PURPOSES

There appears to be two unstated project purposes. The first relates to providing improved recreational boat access to the Gulf. Since the existing bridge across the channel is not proposed to be raised to allow sailboat access, it would appear that the reason for the channel extension is to provide recreational powerboat access from Laguna Madre to the Gulf. For example, on page 1-7 it states, "[t]he design of the channel width and depth was based on previous study results and boat registration statistics for the area, which determined that a 40-foot Bertram Yacht encompassed the majority of registered boats in the area. Therefore, a Bertram 390 Yacht was used as the maximum size vessel for the Packery Channel design." If this is the project purpose, recreational demands for such access should be presented in the FEIS.

The second unstated and unanalyzed project purpose appears to be to increase economic development on North Padre Island. That the local sponsor is counting on economic benefits is demonstrated by the fact that the local share of the project would be paid from increased tax revenues generated on private lands adjacent to the new Packery Channel cut. The DEIS states, "[t]he theory is that construction of the proposed Project and proposed recreational development would generate higher tax revenues due to secondary private development, and that without the proposed Project as stimulus, the increased tax revenues would not occur" [page 4-57]. Therefore, the FEIS should include an analysis regarding the potential for induced development on Padre Island as a direct result of this project. Please include these project purposes in the FEIS.

PROJECT IMPACTS

In addition to properly identifying and analyzing the direct and secondary project purposes, the direct and secondary project impacts need to be thoroughly analyzed. For instance, we understand that a proposed disposal area designated as MMPA (Maintenance Material Placement Area), west of Packery Channel, has been withdrawn since the DEIS was written. Therefore, a new disposal area needs to be designated. Also, about five acres of seagrasses may be impacted, as well as eleven acres of salt marsh. Although compensation is proposed, seagrass creation is problematic and unpredictable. Also, we could not find any compensatory mitigation for salt marsh impacts. Impacted marsh should be replaced at a 2:1 ratio with conditions similar to those proposed for the seagrass planting.

Similarly, the secondary impacts from this project need to be more fully addressed. The DEIS (section 4.11, p.454) states that secondary development will occur and in fact is necessary for the project sponsor to meet the funding match requirement, yet no environmental impacts associated with that development are discussed. Additional marinas, canal communities, and waterfront commercial development may, in the foreseeable future, impact wetlands, seagrasses, and intertidal flats. The cumulative impact of such activities could be significant. Therefore, an analysis should be provided regarding the potential impacts from induced development on Padre Island as a result of this project. Please discuss fully in the FEIS.

ECONOMIC ANALYSIS

The DEIS should include a cost-benefit analysis, since this project will involve expensive maintenance (maintenance dredging of the channel, pumping sand across the jetties, and monitoring). It is difficult to make an informed analysis weighing the national environmental and economic costs to the national and local environmental benefits in the absence of projected construction and maintenance outlays required. As the document stated (page ES-1), "the environmental benefits of all alternatives were essentially negligible." Since this is proposed as an environmental restoration project with a number of ecological unknowns, yet few predicted ecological benefits, a full cost accounting is necessary in order to properly weigh the environmental risks. Please discuss this concern fully in the FEIS.

RECOMMENDATIONS

The DEIS offers little evidence that the project purposes would be achieved. We therefore ask that the Final EIS provide more information in the areas address above to support the project purpose and need. In view of the current analysis, we find and recommend that the no action be considered the least damaging practical alternative and therefore recommend its selection as the preferred alternative.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 29, 2003

Environmental Section

Mr. Robert D. Lawrence, Chief
Office of Planning and Coordination (6EN-XP)
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Mr. Lawrence:

Reference is made to your correspondence of July 29, 2002, concerning the Draft Environmental Impact Statement for the North Padre Island Storm Damage Reduction and Environmental Restoration Project, Nueces County, Texas. We would like to provide additional information and clarification of the project for your consideration. In addition to specific responses to your comments presented below, we would also like to provide you with the most current project information available for your review. A revised project description based on a Value Engineering (VE) study is Enclosure 1. The VE study addresses engineering and construction aspects of the project with the intent of identifying cost-saving measures, and results in only minimal changes in project footprint and environmental impacts. These changes do not result in significant project modification. Enclosure 2 is a new placement area (PA) identified in response to public comments received on the DEIS. Enclosure 3 is a revised project mitigation plan extensively coordinated with state and Federal resource agencies. In developing this plan, the following mitigation ratios (mitigation acres:acres of impact) were agreed to:

Submerged aquatic vegetation (SAV)	3:1
High salt marsh	1:1
Lower salt marsh	2:1
Tidal flats	1:1

Enclosure 4 is a Memorandum of Understanding (MOU) requiring monitoring of Mollie Beattie Habitat Community (MBHC) for indirect project impacts. All of these revisions will be incorporated into the FEIS. A more fully developed presentation of project alternatives is Enclosure 5.

A number of your comments concern project purpose and justification. As you are aware, the U.S. Congress has authorized and funded this project for construction for the specific purposes of ecosystem restoration and storm damage reduction at Packery Channel. By taking these actions Congress has determined that the project is justified and in the public interest for these stated purposes. In the House of Representatives Conference Report 106-298 for Section 556 of the Water Resources Development Act of 1999, the House indicated that the project they

authorized is the project described by the Nueces County Commissioners Court, or Packery Channel (Enclosure 6). The Corps of Engineers (Corps) has not been directed to provide any further project justification or economic analysis of the project and none will be presented. Neither is any Federal agency required to select the "least damaging practical alternative" as the preferred alternative as you request in your letter (the no action alternative of the DEIS). We have compared three project alternatives and a no action alternative, and fully developed mitigation measures for the preferred plan as required by the National Environmental Policy Act and its implementing regulations. Reasons for selecting the preferred plan will be presented in the Record of Decision for the FEIS.


Additional issues concern sediment transport and hydrologic modeling for the project. Modeling indicates that there will be no storm surge impact resulting from opening the channel. Additional information on this issue will be presented in the FEIS. Sediment modeling indicates that new work material and annual maintenance material will be sufficient to halt current rates of erosion along the beaches to the north and south of the jetties. Additional information will be provided on this modeling in the FEIS.

The impacts of induced development on North Padre Island are presented in as much detail as possible in the DEIS (Section 4.11, p. 4-54), and are based primarily on projections. Your attention is drawn to Section 4.11.4.3 (pp.4-66 to 4-68). The overall conclusion of the socioeconomic analysis presented in the DEIS is that North Padre Island will develop with or without the proposed project. If the project is not built, the development will take longer, but it will occur. Neither recreational boating nor economic development are identified as project purposes by Congress and will not be presented as such in the EIS.

Because the forecast of impacts from private development are based on projections, it is not possible to ascribe specific environmental impacts to this development. Gross acreages of impact are presented in the Socioeconomic section. This is not, however, of sufficient detail for us to address habitat specific impacts in the Cumulative Impacts analysis. We have agreed to include projects for which Corps permits have already been issued in the FEIS Cumulative Impacts analysis. If future private development requires a Corps permit for construction, resource agencies will have the opportunity to review project-specific impacts at that time.

Please direct any questions concerning this letter to Ms. Carolyn Murphy, 409/766-3044.

Sincerely,


Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental
and Regulatory Division

Enclosures

Value Engineering Study

Since coordination of the DEIS in June 2002, there have been minor project design modifications. The project description provided in this Section varies from the project description in the DEIS because it incorporates changes resulting from a Value Engineering (VE) Study conducted for the project. Changes from the DEIS project description resulting from the VE study are summarized below.

The VE Study was initiated in April 2002 to determine if the cost of the project could be reduced without affecting the engineering soundness of the design. Several proposals were implemented with the final design changes adopted in November 2002. The VE study resulted in a reduction in project costs of approximately \$4.75 million. The following proposals were implemented into the project design:

1. The concrete bulkheads and sheet pile walls of Placement Areas 1, 2 and 3 were replaced with sand embankments. Slopes are protected with geotextile fabric and concrete cellular mattresses.
2. The landside jetty cross section was reduced in width approximately 36 feet.
3. The jetty crown width is reduced from 16 feet to 10.5 feet.
4. The jetty walkway was redesigned to 24 inch thick concrete slabs integrated into the jetty to replace the top twenty four inches of jetty rock.
5. The jetty cross section was tapered from the Gulf to the land section, reducing the amount of rock required.
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The VE changes in project design address engineering and construction of the project with the intent of identifying cost-saving measures, and do not result in a change in overall project footprint, additional environmental impacts, new project features, or significant project modification.



August 23, 2002

Ms. Carolyn Murphy, Chief
Environmental Section
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

RE: North Padre Island Storm Damage Reduction and Environmental
Restoration Project (Packery Channel)
City of Corpus Christi Project No. 5122
Packery Channel MMPA – Dredge Site Alignments

Dear Ms. Murphy:

Forwarded is the layout for the MMPA. The disposal limits were outlined on the PBS & J photo/drawing that you provided. This PA will be made up of the two cells encompassing a total of approximately 10.0 acres of upland, high-salt marsh and mud flats. To accommodate the maintenance material, the perimeter dike will be built with a top elevation of 20 feet from the ground elevation, maintaining a 4-foot top width and 3 to 1 slopes. This site will accommodate anticipated maintenance dredging of 15,000 CY of material every 5 years for the 50-year project life, for a total capacity of 150,000 CY. Two (2) 30-foot wide construction access corridors are included for equipment access from Packery Channel.

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Angel R. Escobar, P.E.
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ARE:rr

Encls.

cc: Col. Leonard d. Waterworth, Corps of Engineers
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North Padre Island Storm Damage Reduction and Environmental Restoration Project Mitigation Plan

- I. To mitigate for the subject project, the City of Corpus Christi (city) will construct or cause to be constructed breakwater(s) that will assist in protecting Shamrock Island and will create or cause to be created a approximately 15.6 acres of submerged aquatic vegetation (SAV). Construction of the breakwater(s) must be concurrent with the construction of Packery Channel.
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The City will require that wherever possible, the CBBEP will seek matching or other funds to further protect or enhance the Island.

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- V. The entire \$1,250,000 will be held and utilized solely for the protection and enhancement of Shamrock Island and adjacent state owned submerged land. The CBBEP will undertake those actions recommended by the team after review of the studies to protect and enhance Shamrock Island. In no event will the cost of project management, alternatives analysis, engineering and design, permitting, and construction oversight exceed 20% of the funds deposited.

EXHIBIT E

- VI. The CBBEP with the consensus of the team and with the approval of the GLO and the Nature Conservancy will determine specific locations of the breakwater(s), type of breakwater(s), and habitat creation.

If the breakwater(s) is/are constructed of rock, the footprint of the breakwater(s) will be considered habitat creation, provided the GLO and Nature Conservancy approve the configuration.

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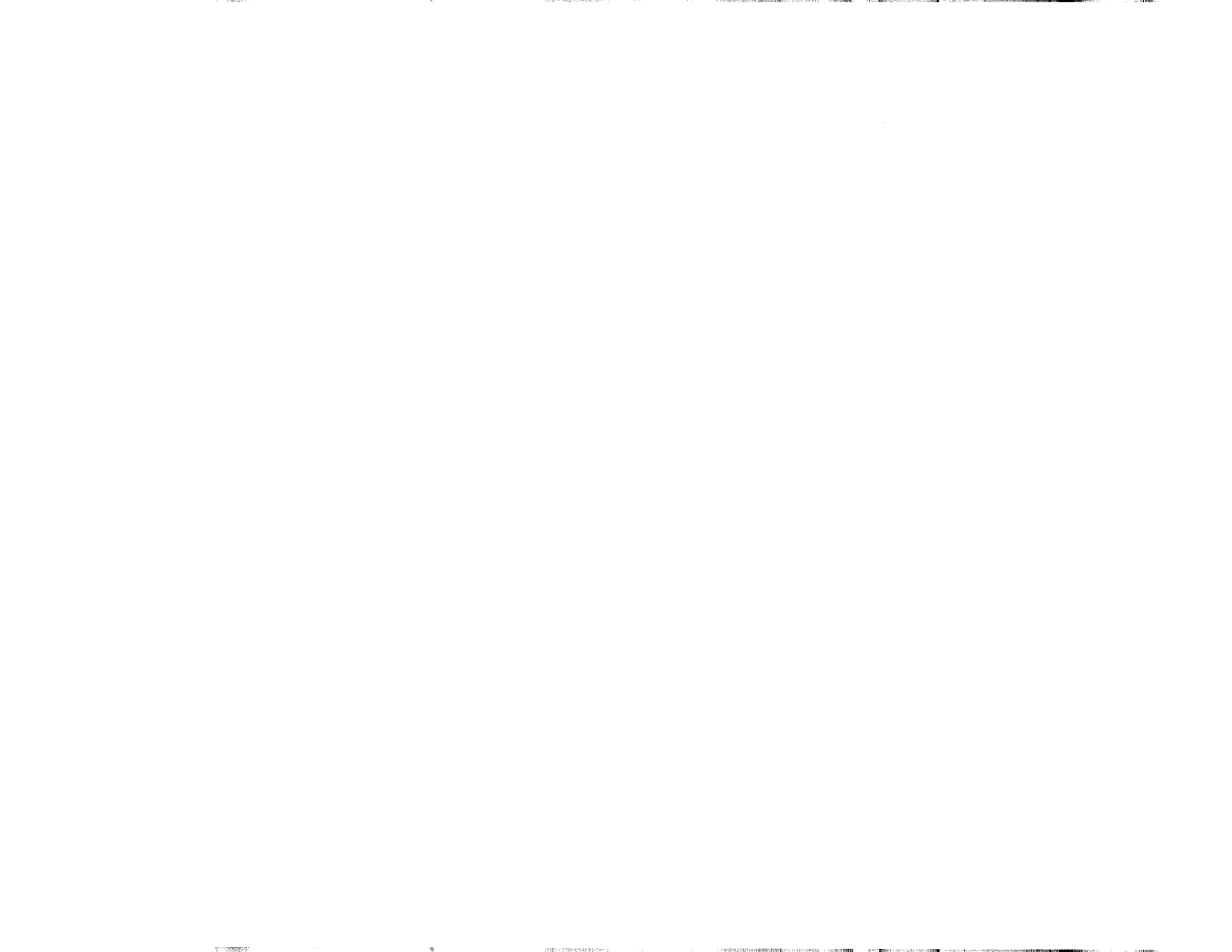
Enclosure 4, MOU for the MBHC was included in the USACE response letter, however see Appendix A for this document.

Enclosure 5, developed project alternatives, was included in the USACE response letter, however see Section 2.0 in the FEIS.

Enclosure 6

House of Representatives Report 106-298: House No. 569; Senate No. 323 – House
recedes with an amendment.

The conferees understand the authorized project is described in the Nueces County
Commissioners Court report dated March 31, 1997.



Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*
Jeffrey A. Saitas, *Executive Director*



TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

July 29, 2002

U.S. Army Corps of Engineers
Galveston District CESWG-PE-RE
P.O. Box 1229
Galveston, Texas 77553-1229

Attn: Mr. Sam J. Watson

Re: USACE Draft Environmental Impact Statement - North Padre Island Storm Damage Reduction and Environmental Restoration

Dear Sir:

The United States Army Corps of Engineers (Corps) was directed by Congress to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island. The project consists of the construction of a channel between the Laguna Madre and the Gulf of Mexico across North Padre Island, Nueces County, Texas. This would be accomplished by dredging a 12-foot-deep by 116-foot-wide channel to connect the existing Packery Channel to the Gulf of Mexico and by dredging the existing channel to a depth of -7 feet (mean sea level) and a width of 80 feet. Approximately 810,000 cubic yards (cy) of material will be dredged during construction, and 544,800 cy will be placed on the beach south of the proposed jetties in order to provide sand for nourishment of the eroding beach at Packery Channel. This will result in a reduced potential for future storm damage to North Padre Island. The remainder of the dredged material will be placed in one of three placement areas (PA) adjacent to the newly dredged portion of the Packery Channel (PA 1, 2, and 3) or in a maintenance material placement area (MMPA) proposed on property belonging to Nueces County located south of the channel and northwest of State Highway (SH) 361. Sandy maintenance material from the channel east of the SH 361 bridge will also be used for beach nourishment, and a sand bypass system will be designed to move accumulated sand from longshore drift to the downdrift side of the jetties. Over the 50-year life of the project, approximately 11,000,000 cy of sandy maintenance material will be placed on the beach adjacent to the jetties. Approximately 15,000 cy of estimated maintenance dredging every 5 years will be placed in upland disposal site(s). The project will also create a water exchange pass between the Laguna Madre and the Gulf of Mexico, which will periodically reduce hypersaline conditions in the Laguna Madre. The local sponsor of this project is the City of Corpus Christi.

Direct impacts from this project include the following:

- potential loss of 5.2 acres of submerged aquatic vegetation, 10.9 acres of high saltwater marsh, 0.2 acre of low saltwater marsh, 0.2 acre of algal flats, 1.6 acres of mud flats, and 27.1 acres of primary and secondary dunes
- 16.1 acres of channel fill sands
- 58.9 acres of beach
- 38.7 acres of bay-side open water
- 10.9 acres of gulf-side open water
- 9.9 acres of grassland

Mitigation for submerged aquatic vegetation has been proposed in the Draft Environmental Impact Statement (DEIS) on a 3 to 1 ratio and 15.6 acres are proposed to be planted in the same mitigation area proposed for planting as part of the Corpus Christi Ship Channel Project. This would result in a larger seagrass meadow in a single area. As dune mitigation, the City of Corpus Christi's Dune Protection Permit Application to the General Land Office (GLO) notes that approximately 1.5 acres of displaced critical/vegetated dunes will be mitigated by relocating the displaced dunes immediately northeast of PA2 into a depressional land area landward of the existing foredune ridge. Critical dunes will be restored to approximate natural position, sediment content, volume, elevation, and revegetated using native species. No mitigation has been proposed in the DEIS for impacts to saltwater marsh, algal flats, or mud flats.

Insufficient information is contained in the public notice to complete a water quality certification determination. The following issues must be addressed before a certification can be completed. Responses to this letter may raise other questions that will need to be addressed before a water quality certification determination can be made.

- The Texas Natural Resource Conservation Commission (TNRCC) has received a copy of a letter from the City of Corpus Christi to The Honorable Joe McComb, Nueces County Commissioner, Precinct 4, dated June 17, 2002, stating that the proposed PA referred to in the DEIS as MMPA is no longer being considered as a placement area for dredged material unsuitable for beach placement. The letter also states that a replacement PA for this site has not yet been selected. Please inform this agency as soon as possible once a final PA has been chosen, and reflect the changes to habitat impact(s) due to this change in project plans.
- No details were provided in the DEIS regarding scouring protection under the SH 361 bridge in order to avoid possible long term impacts of the channel to the Mollie Beattie Habitat Community. Mention of this protection was made in a meeting on July 8, 2002, with the Corps, the City of Corpus Christi, GLO, National Marine Fisheries Service, United States Fish and Wildlife Service (USFWS), Texas Parks and Wildlife Department (TPWD), and the

TNRCC, but no details were provided. Please provide schematics and a detailed written description of the scouring protection as well as an explanation of why the method/amount of protection is appropriate.

- According to the Memorandum of Agreement between the USFWS and GLO, the Mollie Beattie Habitat Community property boundary is shown incorrectly on all maps in the DEIS. The correct boundary is on the southwest side of the proposed Packery Channel extension. Please correct all maps in the DEIS as well as any written descriptions within the DEIS that may be affected by this correction.
- Although the proposed change in tidal movement within the Packery Channel is expected to be minimal once the channel is connected with the Gulf of Mexico, there is no information in the DEIS addressing how this slight increase in tidal flow might affected the Mollie Beattie Habitat Community. This area exhibits little topography. A slight increase in tidal flow could result in the loss of a significant area of piping plover habitat. Please provide written documentation detailing the effects of increased tidal movement on the Mollie Beattie Habitat Community.
- During maintenance dredging periods, the City of Corpus Christi has proposed to repair and/or mitigate for any secondary impacts to the Mollie Beattie Habitat Community. One suggestion made during the July 8, 2002, meeting was that this include routine mapping and aerial photographs in order to better determine what long term impacts the project may be having on the Mollie Beattie Habitat Community. Please amend the DEIS to include these suggestions. Also include details of the process the City intends to follow to address secondary impacts in the future.
- The delineation of habitat types in the project area was achieved mainly through aerial photograph interpretation with some ground truthing. No regular transects were sampled. This is not the preferred method for performing delininations. Please provide justification regarding why this method was chosen and why this chosen method adequately depicts the habitat type and size present on the project site.
- Please provide a more detailed delineation of habitat size and type present within the overlap of the project site and the Mollie Beattie Habitat Community.
- Section 1.1 of the DEIS describes one purpose of the project as being, "to create a water exchange pass that will periodically reduce hypersaline conditions in the Laguna Madre for ecosystem restoration." TNRCC staff does not understand how reducing hypersaline conditions in the Laguna Madre can be perceived as ecosystem restoration. Please explain this statement or remove it from the document.

- Section 4.15.4 of the DEIS titled "Compensation" discusses the creation of 5.2 acres of shallow-water seagrass habitat within the Packery Channel. During the July 8, 2002, meeting, the PBS&J consultant working on this project explained that this was not being proposed as part of the mitigation package for project impacts; however, Section 4.15.4 reads as though this 5.2-acre creation is part of the proposed mitigation. Please amend this section of the document in order to clarify this point.
- The TNRCC would like to reiterate comments made during the July 8, 2002, meeting regarding the proposed seagrass mitigation site. The proposed Corpus Christi Ship Channel seagrass mitigation site is not located in this project area and has yet to gain approval in a Corps permit action. The TNRCC recommends that the seagrass mitigation for this project not be carried out at this location. Instead, the TNRCC would prefer to see seagrass planting occur within the same area as the proposed project. A better mitigation opportunity may exist in either Coyote Island or islands created in the area by dredge disposal from previous projects. These islands could be scrapped down to not only create seagrass habitat but wetland habitat as well.
- No mitigation for saltwater marsh, algal flat, or mud flat impacts has been included in the DEIS. Please forward this information to the TNRCC once a mitigation plan has been prepared.
- Effluent from an upland contained disposal area is not to exceed a total suspended solids (TSS) concentration of 300 mg/l. Please provide written documentation to this agency acknowledging awareness of and agreeing to abide by the 300 mg/l maximum TSS concentration. If no return water is expected to be released from the upland contained disposal area, please provide written documentation to this agency to that effect.

The TNRCC looks forward to receiving and evaluating other agency or public comments. Please provide any agency comments, public comments, as well as the applicant's comments, to Ms. Debbie Miller of the Water Quality Division MC-150, P.O. Box 13087, Austin, Texas 78711-3087. Ms. Miller may also be contacted by phone at (512) 239-1703, or by e-mail at demiller@tnrcc.state.tx.us.

Sincerely,



Mark Fisher, Manager
Water Quality Assessment Section
Water Quality Division
Texas Natural Resource Conservation Commission

MF/DKM/emh



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

January 22, 2003

Environmental Section

Mr. Michael D. Cowan, Director
Water Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Dear Mr. Cowan:

Reference is made to your correspondence of July 29, 2002 concerning the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel). You indicate that additional information is required in order for you to complete a Clean Water Act Section 401 water quality certification determination. We would like to take this opportunity to provide you with that information.

As a result of resource agency meetings and coordination during this last year, the following mitigation ratios (mitigation acres:acres of impact) have been agreed to:

Submerged aquatic vegetation (SAV)	3:1
High salt marsh	1:1
Low salt marsh	2:1
Tidal flats	1:1

In addition, Shamrock Island, located north of the Packery Channel project area, was agreed upon as an appropriate mitigation site. A mitigation plan is attached and will be incorporated into the FEIS (Enclosure 1). The mitigation plan addresses all direct construction impacts resulting from channel and placement area construction.

A new placement area (PA) has been identified to replace the MMPA described in the DEIS and is described in Enclosure 2. The PA will be made up of two cells encompassing approximately 10 acres of upland, high salt marsh, and tidal flats. Levees will be approximately 20-feet tall with 3 to 1 side slopes. This site will accommodate anticipated maintenance dredging of 15,000 cy of material every 5 years for the 50-year project life, for a total capacity of 150,000 cy. Two 30-foot construction access corridors are included for access from Packery Channel.

The boundary of the Mollie Beattie Habitat Community (MBHC) that appears in the DEIS was provided by the General Land Office (GLO) during development of the DEIS. We have requested an accurate map and legal description from GLO, and will correct all depictions and references to MBHC in the FEIS. Although our project modeling indicates there will be minimal or no secondary impacts to MBHC (see discussion below), a Memorandum of Understanding (MOU) requiring monitoring and potential future mitigation of MBHC has been signed by the City of Corpus Christi (City) and GLO, as the lead state agency and land-owner representing the MBHC Management Team (Encl. 3). Both the Mitigation Plan and MOU have been attached to the City's GLO lease for project lands, and both will be incorporated into the FEIS.

As a result of the two resource agency meetings held in July 2002, additional information on hydrographic modeling was prepared and provided to the resource agencies. Additional information presented included: 24-hour data for diurnal wind and actual tide data (versus the sinusoidal wind and tide data presented in the DEIS), 24-hour data for with and without Packery Channel; and 30-day data for with and without Packery Channel. All data were graphed for tidal change, north-south velocity, and east-west velocity. The results confirmed the more general results presented in the DEIS; that there is a minor overall decrease in tidal amplitude near Packery Channel, including the water adjacent to MBHC. Additionally, differences in water velocities are minimal, with and without Packery Channel. There are differences in model results using diurnal winds and actual tides relative to what was presented in the DEIS, but there is no impact on the with and without Packery Channel comparisons; and the system came to equilibrium quickly following the opening of Packery Channel to the Gulf with no short-term fluctuations in tidal amplitude or current velocities. In summary, our modeling indicates that tidal amplitude will decrease between .04 ft and .09 ft in MBHC as a result of channel construction. This is a difference that cannot be measured and that already occurs within the existing natural tidal fluctuation. We do not believe that this minor change will have any adverse effect on a barrier island environment that is routinely subjected to high energy events that far exceed this change. It is our conclusion that there will be no impact on MBHC or piping plover critical habitat resulting from change in tidal amplitude from this project. This additional information on modeling will be presented in the FEIS. It is our understanding after the presentation and discussion of these results that all resource agency modeling issues have been resolved.

Delineation of habitat types was performed through use of aerial photographs that were extensively ground-truthed. We find this to be more accurate than the transects discussed at the meeting. When an issue was made of this at our initial resource agency meeting on July 8, 2002, a field trip to verify the accuracy of habitat mapping was planned and conducted on July 11, 2002. Representatives of U.S. Fish & Wildlife Service, Texas Parks & Wildlife Department, and GLO accompanied PBS&J and Corps staff to verify habitat mapping. Mapping of the entire channel to the crash basin was reviewed in the field. This included all areas of MBHC that will be impacted by the

channel project. The extent and identification of habitat types were verified to the satisfaction of all members present and minor discrepancies were adjusted and included in the FEIS.

Section 1.1 of the DEIS accurately reflects the project purpose and justification established by action of the U.S. Congress and will not be revised. The project description has been modified as a result of a Value Engineering (VE) Study conducted in the fall of 2002. A revised project description and summary of changes made as a result of the VE Study is Enclosure 4. The VE changes address the engineering and construction of the project with the intent of identifying cost-saving measures, and result in only minimal changes in project footprint or environmental impacts. These changes do not result in significant project modification. As a result of VE changes, sheet pile walls along the jetty channel in Reach 1 have been replaced with armored concrete cellular mats to a depth of -2ft MLLW. All references to potential SAV habitat along the Reach 1 channel have been removed from the EIS.

The revised project description also includes information on the project placement areas (PAs). There are a total of six placement areas (PA) designated for this project. These are PA Nos. 1, 2, 3, 4S, 4N, and MMPA.

Placement Area No. 1 and the MMPA will be confined upland areas. These will be the only confined areas that will received hydraulically dredged material. The levee height and size of PA No. 1 were designed to achieve effluent quality that would not exceed 300 mg/l of Total Suspended Solids (TSS).

The size of the proposed MMPA was dictated by available acceptable real estate. For this reason the size could not be designed specifically to meet the effluent quality requirement. However, the levee height and configuration were designed to help comply with the requirement.


PA No. 1 will drain into the Inner Basin, while the MMPA will drain into Reach 2 of the Packery Channel. Both areas will use water control structures that will allow the water level within the PAs to be manipulated to provide ponding that would promote the settling of fine-grained material. During dredging operations, the quality of the TSS in the effluent will be regulated by adjusting either the outlet weir or the rate of dredging, as appropriate. Contract specifications will require the contractor to monitor effluent quality and ensure that dredging operations will not result in TSS levels that exceed 300 mg/l.

Placement Area Nos. 2 and 3 will be used to receive material that is mechanically excavated. Therefore, there will be no return water associated with these areas. Some incidental water may be entrained during mechanical dredging from the channel between Stations 136+50 and 140+53; but, the amount of water thus removed is considered to be *de minimis*. This material will be placed into PA No.3.

Placement Area Nos. 4S and 4N are unconfined beach placement areas. Material will be discharged directly onto the beach for nourishment purposes. Small temporary retaining dikes will be constructed to help hold the material. No water control structures will be used in these areas.

Please contact Ms. Carolyn Murphy at 409/766-3044 or Mr. Rob Hauch at 409/766-3913 if additional information is needed or if you have additional questions. Your prompt response and issuance of Section 401 water quality certification for this project will be appreciated.

Sincerely,


Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental,
And Regulatory Division

Enclosures

North Padre Island Storm Damage Reduction and Environmental Restoration Project Mitigation Plan

- I. To mitigate for the subject project, the City of Corpus Christi (city) will construct or cause to be constructed breakwater(s) that will assist in protecting Shamrock Island and will create or cause to be created a approximately 15.6 acres of submerged aquatic vegetation (SAV). Construction of the breakwater(s) must be concurrent with the construction of Packery Channel.
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City of
Corpus
Christi

August 23, 2002

Ms. Carolyn Murphy, Chief
Environmental Section
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

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Director of Engineering Services

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February 5, 2003

Environmental Section

Mr. Michael D. Cowan, Director
Water Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Dear Mr. Cowan:

Reference is made to our previous correspondence of January 22, 2003, concerning the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel). In that letter and accompanying enclosures we provided to you the most current and accurate project information for your consideration in processing a Clean Water Act Section 401 water quality certification determination for the project. Subsequent discussions have identified issues that require further clarification, specifically in regard to the project mitigation plan.

Comments received from state and Federal resource agencies, including Texas Council on Environmental Quality (TCEQ) during the comment period for the DEIS this summer, resulted in the formulation of a new mitigation plan for the project. A series of meetings with resource agencies including TCEQ were held beginning in July 2002 through November 2002 to develop a new mitigation plan. The following is a brief summary of that plan formulation.

In the initial meetings during the summer of 2002, the issues of acres of habitat impact and habitat mitigation ratios were resolved. Agreement was reached on direct construction impact acreages and the following mitigation ratios (mitigation acres:acres of impact) agreed to:

Submerged aquatic vegetation (SAV)	3:1
High salt marsh	1:1
Low salt marsh	2:1
Tidal flats	1:1

The resource agencies expressed the concern that mitigation occur as close to Packery Channel as possible. Several months were spent trying to develop a mitigation plan to accomplish the above ratios on Coyote Island, which is located near the project area. In the end, the cost of mitigation on Coyote Island was prohibitive, and the resource agencies were again consulted. We requested their input on other possible mitigation locations. The resource agencies concurred that they would like to see project mitigation occur at Shamrock Island in Corpus

Christi Bay, somewhat north of the Packery Channel project area. Several meetings were held to discuss how mitigation would be accomplished on Shamrock Island.

Shamrock Island is owned by the General Land Office (GLO) and the Nature Conservancy. As a result, the Nature Conservancy was included in the discussions, as was the Coastal Bend Bays and Estuaries Program (CBBEP), who had participated in other restoration projects on Shamrock Island. A number of potential restoration projects were discussed by the resource agencies for Shamrock Island, and included participation by TCEQ staff. It was the concurrence of the resource agencies, including U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, GLO, National Marine Fisheries Service, and we assumed, TCEQ, that the following mitigation plan would be implemented for the project (Enclosure 1).

The Corps and local sponsor, the City of Corpus Christi, would transfer \$1,250,000 to CBBEP for project mitigation of Packery Channel to be accomplished on Shamrock Island. Lengthy discussion of specific mitigation projects and goals resulted in the resource agency decision that the 3:1 mitigation ratio for submerged aquatic vegetation (SAV) would be required of the Shamrock Island mitigation plan. After the SAV mitigation is accomplished, the remaining mitigation funds would be spent on restoration projects to be determined by a team consisting of CBBEP, the Nature Conservancy, GLO, and any other state or Federal resource agency wishing to participate, including TCEQ. The decision to not require the acre per acre mitigation of the other three habitat types requiring mitigation (high salt marsh, low salt marsh, and tidal flats) was very deliberate on the part of the resource agencies. After much discussion it was decided by the resource agencies that they wanted the flexibility to accomplish any restoration project or projects they felt beneficial to Shamrock Island, rather than being tied to the strict habitat mitigation ratios agreed upon during the meetings held during the summer of 2002. It will thus be at the discretion of the resource agencies, including TCEQ, as to how the mitigation funds are spent and what kinds and quantities of habitat are produced.

In discussions with your staff, it has become apparent that after this lengthy coordination process, TCEQ now has issue with the mitigation plan not accomplishing strict habitat mitigation goals for all habitat types. If at this point, this becomes a requirement for Clean Water Act certification, it will compel us to develop and coordinate a new mitigation plan, which will substantially delay this project. Such a delay will jeopardize award of GLO grant funds to the City of Corpus Christi.

We hope that this information clarifies the development of the mitigation plan for Packery Channel sufficiently that your agency can issue Section 401 Certification for this project. It is our understanding that you have no issues with the actual construction of the project

and its placement areas in terms of water quality. If any additional information or clarification is needed for your action, please do not hesitate to contact Ms. Carolyn Murphy at 409/766-3044. Your prompt response and issuance of Section 401 water quality certification for this project will be greatly appreciated.

Sincerely,

A handwritten signature in black ink that reads "Carolyn Murphy". The script is cursive and fluid, with the first name and last name clearly distinguishable.

Carolyn Murphy
Chief, Environmental Section

Enclosure

CF w/out Encl:
PM-J, Mr. Anderson

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*
Margaret Hoffman, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

February 7, 2003

Ms. Carolyn Murphy
U.S. Army Corps of Engineers (USACE)
Galveston District CESWG-PE-PR
P.O. Box 1229
Galveston, Texas 77553-1229

Re: USACE Permit Application: Environmental Assessment for North Padre Island Storm Reduction and Environmental Restoration

Dear Ms. Murphy:

Thank you for your recent letter describing the mitigation efforts of the Corps and City of Corpus Christi relating to the above project. The United States Army Corps of Engineers (Corp) was directed by Congress to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island. The City of Corpus Christi is the local sponsor for this project. The project consists of the construction of a channel between the Laguna Madre and the Gulf of Mexico across North Padre Island, Nueces County, Texas. The project goal would be accomplished by dredging a 12-foot-deep by 116-foot-wide channel to connect the existing Packery Channel to the Gulf of Mexico and by dredging the existing Packery channel to a depth of -7 feet mean sea level and a width of 80 feet. Approximately 810,000 cubic yards (cy) of material will be dredged during construction, and 544,800 cy will be placed on the beach south of the proposed jetties in order to provide sand for nourishment of the eroding beach at Packery Channel. The remainder of the dredged material will be placed in one of three placement areas or in a maintenance material placement area. Sandy maintenance material from the channel east of the SH 361 bridge will also be used for beach nourishment, and a sand bypass system will be designed to move accumulated sand from longshore drift to the downdrift side of the jetties. Over the 50-year life of the project approximately 11,000,000 cy of sandy maintenance material will be placed on the beach adjacent to the jetties. Approximately 15,000 cy of estimated maintenance dredging every five years will be placed in upland disposal sites. The local sponsor of the project is the City of Corpus Christi.

In response to the notice to interested parties for the Draft Environmental Impact Statement dated June 6, 2002 and the February 5, 2003 letter from the Corps, the Texas Commission on Environmental Quality (TCEQ) certifies that the proposed activity will not result in a violation of established Texas Water Quality Standards as required by Section 401 of the Federal Clean Water Act and pursuant to Title 30, Texas Administrative Code, Chapter 279.

USACE Permit Application: Environmental Assessment for North Padre Island Storm Reduction and Environmental Restoration

Page 2

February 7, 2003

Your February 5, 2003 letter indicates that the Shamrock Island mitigation plan is the agreed mitigation site. The TCEQ supports the protection of Shamrock Island and the surrounding aquatic resources as mitigation for this project. As described in the mitigation plan, a Submerged Aquatic Vegetation ratio of 3:1 as a result of the creation of 15.6 acres of seagrass habitat and the creation of a berm to prevent erosion of Shamrock Island have been agreed to by the resource agencies and supports our certification of the project. Any funds remaining after these objectives are met will be available for use by the interagency mitigation team to spend at the teams discretion for the types and quantities of habitats produced. Achieving a 1:1 ratio for preservation of aquatic resources is one potential item for consideration of the team.

Wetlands are protected by the Texas Surface Water Quality Standards, and play a major role in maintaining water quality. The TCEQ supports a goal of no net loss of wetland resources. To ensure achieving this goal, the TCEQ commits to participate in the interagency mitigation team as described in the mitigation plan.

No review of property rights, location of property lines, nor the distinction between public and private ownership has been made, and this certification may not be used in any way with regard to questions of ownership.

We look forward to working with you, the project sponsor and the resource agencies regarding additional related mitigation to this restoration project on the Shamrock Island project. If you require additional information or further assistance, please contact Mr. Michael D. Cowan, Director of the Water Quality Division (MC 145), at (512)239-4050 or by email at, *mcowan@tnrcc.state.tx.us*.

Sincerely,

A handwritten signature in black ink, appearing to read "Margaret Hoffman", with a stylized flourish at the end.

Margaret Hoffman, Executive Director
Texas Commission on Environmental Quality

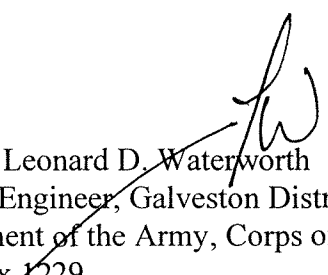
MH/MC/SB/eh



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

July 29, 2002



Colonel Leonard D. Waterworth
District Engineer, Galveston District
Department of the Army, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Colonel Waterworth:

The National Marine Fisheries Service (NOAA Fisheries) has reviewed the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project, Nueces County, Texas, dated June 2002. The U.S. Army Corps of Engineers has been directed by the U.S. Congress to construct the project (P.L. 106-53). The project consists of construction of a channel between the Laguna Madre and across North Padre Island commonly referred to as the Packery Channel Project.

The project site is also located in an area that has been identified by the Gulf of Mexico Fishery Management Council (GMFMC) as Essential Fish Habitat (EFH) for juvenile and subadult red drum (*Sciaenops ocellatus*), post-larval/juvenile and subadult white shrimp (*Litopenaeus setiferus*) and brown shrimp (*Farfantepenaeus aztecus*), adult Spanish mackerel (*Scomberomorus maculatus*), and post-larval/juvenile pink shrimp (*Farfantepenaeus duorarum*). Categories of EFH which would be impacted by the proposed project include estuarine emergent wetlands, seagrass, estuarine open water, algal flats, and estuarine sand/mud substrate. Detailed information on red drum, Spanish mackerel, shrimp and other Federally managed fisheries and their EFH is provided in the 1998 amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the GMFMC. The 1998 EFH amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (P.L. 104 - 297).

In addition to being EFH designated for white, brown and pink shrimp, Spanish mackerel and red drum, the subject marsh complex provides nursery and foraging habitat that supports various forage species and economically-important marine fishery species such as spotted seatrout (*Cynoscion nebulosus*), flounder (*Paralichthys spp.*), Atlantic croaker (*Micropogonias undulatus*), black drum (*Pogonias cromis*), gulf menhaden (*Brevoortia patronus*), striped mullet (*Mugil cephalus*), blue crab (*Callinectes sapidus*), spot (*Leiostomus xanthurus*), pinfish (*Lagodon rhomboides*), silver perch (*Bairdiella chrysoura*), sheepshead (*Archosargus probatocephalus*), gizzard shad (*Dorosoma cepedianum*), bay anchovy (*Anchoa mitchelli*), sheepshead minnow (*Cyprinodon variegatus*), gulf



killifish (*Fundulus grandis*), and silversides (*Menidia* spp.). These estuarine-dependent organisms serve as prey for other fisheries managed under the MSFCMA by the GMFMC (e.g., red drum, mackerels, snappers, and groupers) and highly migratory species managed by the NOAA Fisheries (e.g., billfishes and sharks).

Furthermore, the wetlands and seagrasses in the project area provide other estuarine support functions, including: (1) providing a physically recognizable structure and substrate for refuge and attachment above and below the sediment surface; (2) binding sediments; (3) preventing erosion; (4) collecting organic and inorganic material by slowing currents; and (5) providing nutrients and detrital matter to the Laguna Madre and Corpus Christi Bay. Moreover, the project area provides habitat for many benthic animals, including marine worms and crustaceans, which are consumed by higher trophic level predators such as shrimp, crabs, and black drum. Benthic organisms also have a key role in the estuarine food web because: (1) they mineralize organic matter, releasing important nutrients to be reused by primary producers; (2) they act as trophic links between primary producers and primary consumers;¹ and (3) they can also aggregate dissolved organics within estuarine waters, which are another source of particulate matter for primary consumers.²

Approximately 11.1 acres of estuarine emergent wetlands, 5.2 acres of seagrass, and 1.5 acres of tidal flats will be impacted by the proposed channel dredging and dredged material placement. An additional 0.3 acre of tidal flats will be impacted by the proposed recreational development along the channel by the City of Corpus Christi. Although Section 4.15 (pages 4-70 through 4-75) addresses mitigation for the project, very little detail is given concerning the proposed compensation for the proposed project impacts. In fact, the section does not address proposed compensation for dredge and fill impacts to wetlands or tidal flats. Although the Corps of Engineers acknowledge that approximately 15.6 acres of seagrass mitigation will be required to compensate for the loss of 5.2 acres of seagrass beds, no specific mitigation location was identified in the DEIS. However, the DEIS does mention that shallow shelves along the new channel may be suitable for approximately 5.4 acres of seagrass growth and suggests that the remainder of the seagrass mitigation could somehow coincide with the not currently authorized Corpus Christi Ship Channel Project. We believe that the mitigation area should be created in the same bay system (Laguna Madre) as the proposed impacts and as near to the impact site as possible in order to compensate for the lost habitat values to species managed under the MSFCMA and other living marine resources of commercial and recreational value.

¹Armstrong, N. E. 1987. The ecology of open-bay bottoms of Texas: a community profile. U.S. Fish Wildl. Serv. Biol. Rep. 85(7.12). 104 pp.

²Peterson, C. H., and N. M. Peterson. 1979. The ecology of intertidal flats of North Carolina: a community profile. U.S. Fish Wildl. Serv., Biol. Serv. Program. FWS/OBS-79/39. 73 pp.

Section 305(b)(4)(A) of the MSFCMA requires that NOAA Fisheries provide EFH Conservation Recommendations for any Federal agency action that may result in adverse impacts to EFH. In consideration of the above, NOAA Fisheries recommends that a Department of the Army permit not be granted as currently proposed. Alternatively, to ensure the conservation of EFH and associated fishery resources, final action on the proposed permit should require the following:

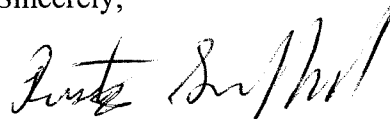
EFH Conservation Recommendations

The Corps of Engineers should compensate for impacts to EFH by creating 15.6 acres of seagrass habitat, 22.2 acres of estuarine emergent wetlands, and 1.8 acres of tidal flats in the general vicinity of Packery Channel.

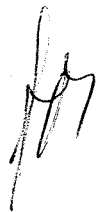
Consistent with Section 305(b)(4)(B) of the MSFCMA and NOAA Fisheries's implementing regulation at 50 CFR 600.920(k), your office is required to provide a written response to our EFH recommendations within 30 days of receipt. Your response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the proposed activity. If your response is inconsistent with our EFH Conservation Recommendations, you must provide a substantive discussion justifying the reasons for not implementing those recommendations. If it is not possible to provide a substantive response within 30 days, the Corps of Engineers should provide an interim response to NOAA Fisheries, to be followed by the detailed response. The detailed response should be provided in a manner to ensure that it is received by NOAA Fisheries at least 10 days prior to final approval of the action.

If we may be of further assistance, please contact Ms. Heather Young and Mr. Rusty Swafford of our Galveston Facility at (409) 766-3699.

Sincerely,



Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division





DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

January 24, 2003

Environmental Section

Mr. Andreas Mager, Jr.
Assustabt Regional Administrator
Habitat Conservation Division
National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Mager:

Reference is made to your correspondence of July 29, 2002, concerning the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel) and your proposed Essential Fish Habitat (EFH) Conservation Recommendations. The DEIS initiated EFH consultation under the Magnuson-Stevens Fishery Conservation and Management Act. In your letter you request additional information on project mitigation. A revised project mitigation plan is Enclosure 1 and is briefly discussed below. In addition, we would like to take this opportunity to also provide you with information on monitoring of Mollie Beattie Habitat Community (MBHC) (Encl. 2), a revised project description reflecting modifications resulting from a Value Engineering (VE) study (Encl. 3), and a new placement area (PA) (Encl. 4).

As a result of resource agency meetings and coordination during this last year, the following mitigation ratios (mitigation acres of impact) have been agreed to:

Submerged aquatic vegetation (SAV)	3:1
High salt marsh	1:1
Low salt marsh	2:1
Tidal flats	1:1

In addition, Shamrock Island, located north of the Packery Channel project area, was agreed upon as an appropriate mitigation site. A mitigation plan is attached and will be incorporated into the FEIS (Encl. 1). The mitigation plan addresses all direct construction impacts resulting from channel and placement area construction.

Although our project modeling indicates there will be minimal or no secondary impacts to MBHC, a Memorandum of Understanding (MOU) requiring monitoring and

potential future mitigation of MBHC has been signed by the City of Corpus Christi (City) and General Land Office (GLO), as the lead state agency and land-owner representing the MBHC Management Team (Encl. 2). Both the Mitigation Plan and MOU have been attached to the City's GLO lease for project lands, and both will be incorporated into the FEIS.

Section 1.2 of the DEIS, project description, has been modified as a result of a Value Engineering (VE) Study conducted in the fall of 2002. A revised project description and summary of changes made as a result of the VE Study is Enclosure 3. The VE changes address the engineering and construction of the project with the intent of identifying cost-saving measures, and result in only minimal changes in project footprint or environmental impacts. These changes do not result in significant project modification.

A new PA has been identified to replace the MMPA described in the DEIS and is described in Enclosure 4. The PA will be made up of two cells encompassing approximately 10 acres of upland, high salt marsh, and tidal flats. Levees will be approximately 20-feet tall with 3 to 1 side slopes. This site will accommodate anticipated maintenance dredging of 15,000 cy of material every 5 years for the 50-year project life, for a total capacity of 150,000 cy. Two 30-foot construction access corridors are included for access from Packery Channel.

In conclusion, we concur with your conservation recommendations and have presented mitigation and monitoring plans for the project. It should be noted that this is an authorized Federal construction project and not a Corps permit action; no permit will be issued.

Should you have concerns about any of these project revisions or require additional information, please contact Ms. Carolyn Murphy at 409/766-3044 at your earliest convenience.

Sincerely,



Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental,
and Regulatory Division

Enclosures

North Padre Island Storm Damage Reduction and Environmental Restoration Project Mitigation Plan

- I. To mitigate for the subject project, the City of Corpus Christi (city) will construct or cause to be constructed breakwater(s) that will assist in protecting Shamrock Island and will create or cause to be created a approximately 15.6 acres of submerged aquatic vegetation (SAV). Construction of the breakwater(s) must be concurrent with the construction of Packery Channel.
- II. The City shall be responsible to the Texas General Land Office and the School Land Board for successful completion of all of the requirements of this Mitigation Plan.
- III. The city will partner with and work through the Coastal Bend Bays and Estuaries Program (CBBEP) to perform the required mitigation. The city will deposit \$1,250,000 with the CBBEP to fund the required mitigation. As a condition of the transfer of funds to the CBBEP, the city will secure the written commitment of the CBBEP to be bound to all the terms, conditions, and requirements of this Mitigation Plan. This funding will be for the exclusive use of protecting and enhancing Shamrock Island, including the creation of 15.6 acres of SAV. Once the project is determined by the GLO to be successful, any remaining funds will be used to further enhance Shamrock Island and adjacent submerged state owned land.

The City will require that wherever possible, the CBBEP will seek matching or other funds to further protect or enhance the Island.

- IV. A team consisting of the Nature Conservancy, CBBEP, GLO, and applicable state and federal resource agencies (team) will provide input into the project. All recommendations of the team will be a consensus of the team, and must be approved by the GLO and Nature Conservancy as landowners. Working with this team, the CBBEP will undertake appropriate studies to determine the correct pattern of work to be undertaken. Areas of work to be considered will include, but not be limited to, protection of the North end of the Island, protection of the South end of the Island, re-nourishment of the feeder beach, and possible repair and/or upgrade of the existing geotube. One requirement for successful completion of the project will be the creation of 15.6 acres of SAV.
- V. The entire \$1,250,000 will be held and utilized solely for the protection and enhancement of Shamrock Island and adjacent state owned submerged land. The CBBEP will undertake those actions recommended by the team after review of the studies to protect and enhance Shamrock Island. In no event will the cost of project management, alternatives analysis, engineering and design, permitting, and construction oversight exceed 20% of the funds deposited.

EXHIBIT E

- VI. The CBBEP with the consensus of the team and with the approval of the GLO and the Nature Conservancy will determine specific locations of the breakwater(s), type of breakwater(s), and habitat creation.

If the breakwater(s) is/are constructed of rock, the footprint of the breakwater(s) will be considered habitat creation, provided the GLO and Nature Conservancy approve the configuration.

- VII. The created SAV habitat will be allowed to naturally vegetate for 2 full growing seasons after the breakwater is constructed. If after three years, 50% of the required SAV mitigation has naturally vegetated, the CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 50% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

If after five years, 70% coverage of the required SAV mitigation has not been achieved; CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 70% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

It is understood and agreed by all parties that the city's financial contribution shall be limited to \$1,250,000 and the CBBEP's actions to plant seagrass, if required, shall come from this amount.

- VIII. The CBBEP, on behalf of the city, will submit annual reports beginning in year 3 to the GLO indicating the percent coverage and acreage of SAV, and acreage and habitat of Shamrock Island.

- IX. The project will be determined to be a success when the breakwater(s) has/have been installed, approximately 15.6 acres of SAV has been created, and no significant amount of habitat (excluding open water fish habitat) has been lost on Shamrock Island. There may be some changes in habitat type on Shamrock Island resulting from reduction of wave energy reaching the island, and this will not cause the project to be deemed unsuccessful.

Enclosure 2, MOU for the MBHC, was included in the USACE response letter, however see Appendix A for this document.

Value Engineering Study

Since coordination of the DEIS in June 2002, there have been minor project design modifications. The project description provided in this Section varies from the project description in the DEIS because it incorporates changes resulting from a Value Engineering (VE) Study conducted for the project. Changes from the DEIS project description resulting from the VE study are summarized below.

The VE Study was initiated in April 2002 to determine if the cost of the project could be reduced without affecting the engineering soundness of the design. Several proposals were implemented with the final design changes adopted in November 2002. The VE study resulted in a reduction in project costs of approximately \$4.75 million. The following proposals were implemented into the project design:

1. The concrete bulkheads and sheet pile walls of Placement Areas 1, 2 and 3 were replaced with sand embankments. Slopes are protected with geotextile fabric and concrete cellular mattresses.
2. The landside jetty cross section was reduced in width approximately 36 feet.
3. The jetty crown width is reduced from 16 feet to 10.5 feet.
4. The jetty walkway was redesigned to 24 inch thick concrete slabs integrated into the jetty to replace the top twenty four inches of jetty rock.
5. The jetty cross section was tapered from the Gulf to the land section, reducing the amount of rock required.
6. The SH 361 bridge fendering system was eliminated. The bridge will be protected by riprap.
7. Placement Area 1 was resized from 20.2 acres to 14.3 acres to keep the levee out of the 1000-foot dune line.

The VE changes in project design address engineering and construction of the project with the intent of identifying cost-saving measures, and do not result in a change in overall project footprint, additional environmental impacts, new project features, or significant project modification.



August 23, 2002

Ms. Carolyn Murphy, Chief
Environmental Section
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

RE: North Padre Island Storm Damage Reduction and Environmental
Restoration Project (Packery Channel)
City of Corpus Christi Project No. 5122
Packery Channel MMPA – Dredge Site Alignments

Dear Ms. Murphy:

Forwarded is the layout for the MMPA. The disposal limits were outlined on the PBS & J photo/drawing that you provided. This PA will be made up of the two cells encompassing a total of approximately 10.0 acres of upland, high-salt marsh and mud flats. To accommodate the maintenance material, the perimeter dike will be built with a top elevation of 20 feet from the ground elevation, maintaining a 4-foot top width and 3 to 1 slopes. This site will accommodate anticipated maintenance dredging of 15,000 CY of material every 5 years for the 50-year project life, for a total capacity of 150,000 CY. Two (2) 30-foot wide construction access corridors are included for equipment access from Packery Channel.

Sincerely,

Angel R. Escobar, P.E.
Director of Engineering Services

ARE:rr

Encls.

cc: Col. Leonard d. Waterworth, Corps of Engineers
Carl M. Anderson, P.E., Corps of Engineers
Herbie Maurer, Corps of Engineers
Manuel Freytes, GLO Regional Director



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

August 2, 2002

Dr. Lloyd Saunders
Chief, Planning, Environmental
and Regulatory Division
Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229
Attn: Carolyn Murphy and Sam Watson

Cons.# 2-11-02-I-255

Dear Dr. Saunders:

The U.S. Fish and Wildlife Service (Service) is reviewing the U.S. Army Corps of Engineers (Corps) Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). The project consists of dredging a 12-foot-deep by 116-foot-wide channel to connect the existing Packery Channel to the Gulf of Mexico and dredging the existing channel to a depth of -7 feet (mean sea level) and a width of 80 feet. The total length of the proposed channel from the Gulf end of the jetties to the Gulf Intracoastal Waterway (GIWW) is approximately 18,500 feet (3.5 miles). Approximately 810,000 cubic yards (cy) of material will be dredged during construction, most of which (544,800 cy) will be placed on the beach south of the proposed jetties. Sandy maintenance material from the channel east of SH 361 bridge will be used for beach nourishment, and a sand bypass system will be designed to move accumulated sand from longshore drift to the downdrift side of jetties. Over the 50-year life of the project approximately 11,000,000 cy of sandy maintenance material will be placed on the beach adjacent to the jetties. Approximately 15,000 cy of estimated maintenance dredging every 5 years will be placed in an upland site.

Recreational development is proposed by the City of Corpus Christi in conjunction with Packery Channel, but is not part of the Federal cost-shared project. The proposed recreational development is described in the DEIS as secondary development. Proposed park amenities encompass approximately 14.2 acres and include access to Packery Channel, the beach and the jetties; passenger and recreational vehicle parking; walkways; restrooms; and vendor facilities. The two potential City of Corpus Christi parks are proposed along the western reach of Packery Channel.

Two copies of the DEIS were received by the Service on June 19, 2002. The Service has identified seven major issues in the DEIS, as they relate to the proposed channel dredging project, that should be addressed in coordination with the Corps, the City of Corpus Christi, (the local sponsor), the

Corps' consultant, PBS&J, and other state and Federal agencies as appropriate, prior to the preparation of the final Environmental Impact Statement for this project. Subsequent to the Service's in-house review of the DEIS, Service representatives participated in an inter-agency meeting on July 8, 2002, with representatives of the Corps, Texas Parks and Wildlife Department (TPWD), National Marine Fisheries Service (NMFS), Texas General Land Office (TGLO), Texas Highway Department (TXDOT), Texas Natural Resource Conservation Commission (TNRCC), City of Corpus Christi (CC), and PBS&J. At the July 8th meeting, discussion of and coordination on a number of issues relative to the DEIS and proposed project was initiated. Following are brief summaries of the Service's primary issues relative to the DEIS and proposed channel dredging project:

- In general, the proposed channel dredging was characterized (salinity, tidal effects and expected habitat changes) on a scale that included all of Corpus Christi Bay and Upper Laguna Madre to Baffin Bay. The grid of the mathematical model set the Mollie Beattie Coastal Habitat Preserve (MBCHP) area in a wide pattern so that less information per area was gained for MBCHP than for other areas included in the model. Additionally, the modeling was restrained by using constant wind velocities and tidal elevations in an area where wind velocities change dramatically and where tidal influence is expected. Understandably, the modeling results indicated a very slight impact when averaged over such a broad area and reported only for the model once it had reached equilibrium; however, as presented, more immediate impacts, specifically to the MBCHP, are not adequately addressed. As a result of the July 8th meeting, additional information is being compiled for the agencies which may assist in the assessment and characterization of the impacts of the proposed channel on the MBCHP and other adjacent areas so that this can be included in the final EIS. To date, additional modeling data has been submitted for several key data points in the modeling study. The data includes with and without Packery channel data for those data points in the 2000 series, but fails to include data without Packery channel for some points in the 5000 series that are currently in water. Data simulated without Packery Channel for the 5000 series would be helpful in determining the significance of the with Packery channel data from the same series.
- The MBCHP as noted in the DEIS is a preserve established by a Memorandum of Agreement between the TGLO and the Service and managed by a team that includes representatives of TGLO, the Service, TPWD, and the National Audubon Society. A Management Plan (MBCHP MP) written by the team outlines general framework for the preservation and stewardship of the site as well as educational goals. As stated in the MBCHP MP, the plan's mission is to promote protection and conservation of the piping plover and other key species of concern and their habitats. Note was made at the July 8th meeting that a portion of Reach 2 of the proposed channel is actually within the MBCHP, not adjacent to it, as is noted in the DEIS. As such, at least this portion of the proposed channel needs to be reviewed relative to the existing MBCHP MP. However, the channel project as a whole could have significant direct and indirect impacts to the MBCHP, and as noted in the first item above, there is a need to identify and characterize the significance of those affects. The Management Team

met on July 31, 2002, to review the channel project relative to the MBCHP MP and to develop appropriate recommendations for assessment and/or monitoring to be included in the final EIS.

- The DEIS identified a Maintenance Material Placement Area (MMPA) on County-owned property; however, in a letter, dated June 17, 2002, from the City of Corpus Christi to the Nueces County Commissioner for Precinct 4, this 7.5 acre site was no longer being considered as a disposal site for the channel project. As a result, a new MMPA needs to be identified that will accommodate approximately 15,000 cy of material, not suitable for beach placement, every 5 years for the 50-year life of the project. When compared to the volumes of material moved in other projects, such as the Gulf Intracoastal Waterway, 15,000 cy of material may appear insignificant. However, 7.5 acres, or whatever size is ultimately deemed necessary to accommodate silty dredged material, in a coastal area can be a scarce commodity, and potentially expensive. The Corps, with the City and appropriate state agencies, have already initiated discussions regarding potential sites for the MMPA. The Service requests to be included in the coordination for site alternatives and their proposed construction methodologies prior to the final site selection.
- The DEIS characterized broad habitat types in and adjacent to the footprint for the proposed project. Additionally, the DEIS identified expected direct impacts of the proposed channel project by acreage and by habitat type. At the July 8th meeting, several agency representatives pointed out that in reviewing the DEIS it appeared that, because of the methodology used by the consultant to map the habitat types, post construction impacts would be difficult to assess. As described in the DEIS, the consultant used on-the-ground mapping in combination with 1995 Digital Ortho-Quarterquads to outline habitat types and general location relative to the proposed channel project. No GIS points were identified, or transect lines established that would allow for accurate post-project assessment. High resolution color aerial photographs, pre- and post-project, were recommended as a means of documenting the site. In a 2 ½ hour site visit on July 11, 2002, with a GIS unit, a number of points were recorded along the waterward boundary of submerged aquatic vegetation (SAV) in the existing channel and basin. The consultant proposed to overlay those points on the existing aerial photographs and provide the results to the agencies. According to the Corps, the potential for current appropriate quality aerial photography is being investigated. The Service anticipates additional coordination on characterization of the project area.
- In the DEIS, the Corps has proposed mitigation for direct impacts only for SAVs. At the July 8th meeting, participants discussed mitigation ratios currently used for other habitat types which will, or could be, impacted by the proposed channel project. These included low salt marsh, high salt marsh, and tidal flats. Additionally, meeting participants discussed the proposed shallow shelves along the bulkheaded portion of Reach 1 and their concern for the stability of the shelves with regards to supporting seagrass. Additional coordination will be needed to identify mitigation sites for the direct impacts of the proposed channel.

- The Cumulative Impacts Assessment of the DEIS, only looked at large federal projects in the Corpus Christi Bay system and did not address the real cumulative effects on the immediate Packery Channel area that have occurred as a result of development over time. Representatives of TPWD and NMFS offered access to information from their databases to be used in conjunction with information in the Corps' RAMs database to characterize the cumulative effects of the proposed channel project on the resources of north Padre Island and Mustang Island.
- The Biological Assessment (BA) was reviewed and comments and recommendations are attached.

In addition to the larger issues noted above, the Service, in its review of the DEIS, found that the document was in need of additional information on the following items:

- The DEIS does not characterize the long-term fate of Placement Areas 1 and 3 either as areas that will be privately developed or as areas containing sand reserves that could readily be used for beach nourishment in the Packery Channel area or elsewhere.
- Given that the proposed channel will establish a new, permanent access to the Gulf of Mexico and adjacent State, Federal and International Waters, the DEIS does not indicate or identify coordination efforts with other entities and agencies whose operations could be affected by the channel opening. The Department of the Navy, U.S. Coast Guard, Immigration and Naturalization Service, Drug Enforcement Agency, and Department of Homeland Security are some agencies that may need to be contacted.

Thank you for allowing the Service to comment. If there are any questions or you need further information please contact Pat Clements at (361) 994-9005.

Sincerely,


ALLAN M. STRAND
Field Supervisor

cc:

D. Watkins, U.S. Fish and Wildlife Service, Albuquerque, NM
M.E. Vega, Texas Parks and Wildlife Department, Corpus Christi, TX
R. Swafford, National Marine Fisheries Service, Galveston, TX
N. Sears, Environmental Protection Agency, Dallas, Tx

**Biological Assessment for Impacts to Endangered and Threatened Species Relative to the
North Padre Island Storm Damage Reduction and Environmental Restoration Project
Nueces County, Texas**

The Service has reviewed the Biological Assessment (BA) in Appendix C and have the following comments.

General Comments

The purpose of the BA is for the Corps to identify listed species that occur in the project area to determine whether the project as proposed “may affect” those listed species. Upon completion of that determination, the Corps submits the BA to the Service for review and requests concurrence with their determinations prior to finalizing the BA. If the Service concurs there will be “no affect” to listed species, the informal section 7 consultation process has ended. If the applicant, in this case the Corps, concludes the project, as proposed, will result in a “may affect” or if the Service does not concur with the “no affect” then formal section 7 consultation is recommended. The formal section 7 consultation process will result in the issuance of a biological opinion expressing the Service’s determination as to whether impacts associated with this project will or will not result in “take” and jeopardize the continued existence of a species and/or adversely modify critical habitat.

The Corps has determined negative impacts will result to the piping plover and four species of sea turtles, but that those impacts will not result in jeopardy. Therefore, it is the Service’s interpretation that the Corps is actually concluding that there is a “may affect” to those species and recommends the Corps enter into formal section 7 consultation.

The Corps has been cooperatively working to improve the hydrological model used to identify potential impacts that may occur to the Mollie Beattie Habitat Community (MBHC), a piping plover designated critical habitat unit. Although changes in tidal amplitude appear to be small, the Service and other agencies are concerned those small changes potentially may cause vegetative alterations that would result in the loss of piping plover habitat. It is our recommendation that the Corps work with the Service, and the MBHC Management Team to develop and implement a monitoring plan to ensure the integrity of the unit.

Currently, the BA only covers impacts from the dredging of the channel. It does not address impacts to listed species from the City’s proposed recreational development and any secondary development in the future. It is appropriate to note that proposed recreational development and secondary commercial development that is proposed in the future, will need to be assessed for impacts to species and their habitat and could potentially require a federal permit or Endangered Species section 10 permit and Habitat Conservation Plan. The Service stands ready to discuss the City’s proposed actions so that ways can be identified to assist the City in accomplishing its goals in the most efficient manner and yet be protective of listed species and their habitats.

Specific Comments

Page C-1: The project area is defined as the construction footprint: the area where the actual dredging and construction will take place including the proposed placement areas.

Comment: Figure 1, on page C-3, shows the project area as being from Corpus Christi Bay to Baffin Bay. This figure may really reflect the study area boundary and for clarity it would be useful to delineate the project area from the study area.

Page C-1: The purpose of the project, as directed by Congress, is for ecosystem restoration and storm damage reduction at North Padre Island. Previous analysis showed that a new water ex-change would significantly ameliorate high salinity episodes in the Upper Laguna Madre. However, it was also found that these episodes are relatively rare, occurring on an average of about 1 year in 5; therefore, the potential environmental benefits to marine resources and area wildlife to be achieved by the project would be negligible.

Comment: If sand can be provided by other dredging activities to nourish the beach and salinity improvement benefits are negligible what other benefits will be achieved by the proposed opening of Packery Channel? Neither the EIS or the BA provide a clear history of past flooding and/or deterioration problems to this area that have been identified as needing to be or will be remediated by the proposed project.

Table 1, page C-2: List of Federally Endangered or Threatened Species in Nueces County.

Comment: If the project area is defined as including both Nueces and Kleberg, the list is correct. If only Nueces County is being considered we would recommend the removal of black lace cactus and northern aplomado falcon. It is also recommended that the Hawksbill sea turtle and leather back turtle be listed as Endangered with critical habitat (E/CH) even though their habitat is designated as outside Texas. The piping plover should also be listed as T/CH.

Page C-5: "Approximately 128,800 cy will be placed on the south side of the channel between the existing seawall and the proposed shoreline protection bulkhead at PA1..PA2..PA3.."

Comment: It was the Service's understanding that there would be no bulkheading to the west of SH 361 on the south side of the existing channel in front of existing residential homes. Please clarify whether bulkheading described on page C-5 will be the north and south sides of the channel and between SH 361 and the Gulf of Mexico.

Page C-11: The BA states that a field survey of the project area was performed by PBS&J ecologists on 17 February 1999.

Comment: Please clarify what type of surveys were performed during that one day of surveying. We recommend including any other dates and types of surveys that were performed. We recommend a copy of those reports be included as appendices or forwarded to the Service for review. A map of surveyed areas would be useful.

It is also noted that surveys were done at Fish Pass and the GIWW, but not done at the Packery site or Mollie Beattie Habitat Community. If surveys were performed in these areas we recommend including them in this BA and/or submitting them to the Service for review. If such surveys have not been performed we recommend current surveys of these sites.

C-11 to C-46: Impact Assessments for Listed Species.

Comment: It is important to note that the responsibility of the federal agency is to determine whether the proposed action "may affect" listed species or designated critical habitat. If a proposed project "may affect" a species or critical habitat then formal section 7 consultation is required. The formal consultation process must result in the Service writing a biological opinion and concluding with the determination of either a jeopardy or no jeopardy to a listed species or adverse or no adverse modification of critical habitat.

The Service concurs with the Corps determination that no impacts will result for the proposed project for the following species:

South Texas ambrosia
black lace cactus
slender rush-pea
brown pelican
bald eagle
whooping crane
mountain plover
eskimo curlew
ocelot
jaguarundi
Manatee

On page C-11, the BA states there will be 6.2 acres, of designated piping plover critical habitat (TX-6 and TX-7), destroyed by construction of the jetties and channel and 24.6 acres of critical habitat will be impacted annually by placement of new construction and maintenance material.

Comment: It was also the Service's understanding that the placement of new construction and maintenance would occur every 2 years on the 24.6 acres of critical habitat. Please clarify.

For sea turtles, the BA states, all sea turtles except for the leatherback, could be negatively impacted, although not jeopardized. Impacts described in the BA are incidental take from dredging, channelization of inshore and nearshore areas causing degradation of foraging and migratory habitat through spoil dumping, degraded water quality/clarity and altered current flow. Modifications could

also occur to nesting areas and or prime nesting sites could be removed when the washover area is dredged. Artificial lighting from developed beachfront areas could also disorient females and hatchling sea turtles causing them to head inland rather than out to sea. Other risks include their potential to be attracted to feeding opportunities at the proposed jetties that will expose them to injury by boat traffic, fishing lines and plastic debris.

The BA states that sea turtles and the piping plover could be negatively impacted, the Service has to interpret this statement as a "may affect". Therefore, upon finalization of the BA, the Service anticipates recommendation to the Corps that formal section 7 consultation be initiated on this project.

The Service recommends the Corps identify conservation measures (timing activities, educational programs, monitoring) that will avoid and minimize impacts to potentially impacted species and designated critical habitat units and incorporate them into the BA. The Service is willing to work with the Corp to identify such measures and provide further recommendations for improving the BA prior to finalizing the document.



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

January 22, 2003

Environmental Section

Mr. Allan M. Strand
Field Supervisor
Ecological Services
U.S. Fish & Wildlife Service
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

Dear Mr. Strand:

Reference is made to your correspondence of August 2, 2002, Cons. #2-11-02-I-255, concerning the Draft Environmental Impact Statement (DEIS) and appended Biological Assessment (BA) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel). Enclosure 1 is a Revised BA addressing your comments and providing the additional information requested in your letter and subsequent meetings held with your staff concerning Endangered Species coordination of this project. At your request and with the submittal of this Revised BA, we initiate formal consultation pursuant to Section 7(a)(2) of the Endangered Species Act for this project.

In addition to information specific to Endangered Species (ES) and Critical Habitat (CH) presented in the BA, we would like to take this opportunity to provide additional project information to you to assist in your review of this action, including information concerning additional project modeling, designation of a new placement area (PA) (Encl. 2), minor project design revisions resulting from a Value Engineering (VE) study (Encl. 3), a Memorandum of Understanding (MOU) addressing Mollie Beattie Habitat Community (MBHC) (Encl. 4), and a revised project mitigation plan (Encl. 5).

We have addressed modeling issues arising from DEIS review comments and two resource agency meetings held in July 2002 with representatives from your office as well as other resource agencies, and it is our understanding that the additional information we provided on modeling satisfied your concerns. At these meetings, the additional information presented included: 24-hour data for diurnal wind and actual tide data (versus the sinusoidal wind and tide data presented in the DEIS), 24-hour data for with and without Packery Channel; and 30-day data for with and without Packery Channel. All data were graphed for tidal change, north-south velocity, and east-west velocity. Please note that the model grid used for MBHC is the same size used for the Corpus Christi Bay National Estuary Program (CCBNEP) model, since it seemed inappropriate

to create a new grid. While the model grid size is finer just outside Packery Channel in the Upper Laguna Madre (where one would expect the most change) than it is adjacent to MBHC, the model grid size in MBHC is as fine or finer than that in much of Corpus Christi Bay, Oso Bay, the Upper Laguna Madre, Baffin Bay, and the Gulf of Mexico. Additionally, the cell sizes adjacent to MBHC range from approximately 400-feet to 700-feet on a side. As was discussed in the July meetings, the model does not address non-water areas, so much of MBHC is not included in the model, only the adjacent water areas.

The results of this additional modeling confirmed the more general results presented in the DEIS; that there is a minor overall decrease in tidal amplitude near Packery Channel, including the water adjacent to MBHC. Additionally, differences in water velocities are minimal, with and without Packery Channel. There are differences in model results using diurnal winds and actual tides relative to what was presented in the DEIS, but there is no impact on the with and without Packery Channel comparisons; and the system came to equilibrium quickly following the opening of Packery Channel to the Gulf with no short-term fluctuations in tidal amplitude or current velocities. In summary, our modeling indicates that tidal amplitude will decrease between .04 ft and .09 ft in MBHC as a result of channel construction. This is a difference that cannot be measured and that already occurs within the existing natural tidal fluctuation. We do not believe that this minor change will have any adverse effect on a barrier island environment that is routinely subjected to high energy events that far exceed this change. It is our conclusion that there will be no impact on MBHC or piping plover critical habitat resulting from change in tidal amplitude from this project. This additional information on modeling will be presented in the FEIS. It is our understanding after the presentation and discussion of these results that all resource agency modeling issues have been resolved.

In response to comments, a new placement area (PA) has been identified to replace the MMPA described in the DEIS and is described in Enclosure 2. The PA will be made up of two cells encompassing approximately 10 acres of upland, high salt marsh, and tidal flats. Levees will be approximately 20-feet tall with 3 to 1 side slopes. This site will accommodate anticipated maintenance dredging of 15,000 cy of material every 5 years for the 50-year project life, for a total capacity of 150,000 cy. Two 30-foot construction access corridors are included for access from Packery Channel.

The project description has been modified as a result of a Value Engineering (VE) Study conducted in the fall of 2002. A revised project description and summary of changes made as a result of the VE Study is Enclosure 3. The VE changes address the engineering and construction of the project with the intent of identifying cost-saving measures, and do not result in a change in project footprint or environmental impacts, or in significant project modification. As a result of VE changes, sheet pile walls along the jetty channel in Reach 1 have been replaced with armored concrete cellular mats to a depth of -2ft MLLW. All references to potential SAV habitat along the Reach 1 channel

have been removed from the EIS. Placement Area No. 1 and the MMPA will be confined upland areas. These will be the only confined areas that will received hydraulically dredged material. The levee height and size of PA No. 1 were designed to achieve effluent quality that would not exceed 300 mg/l of Total Suspended Solids (TSS).

PA No. 1 will drain into the Inner Basin, while the MMPA will drain into Reach 2 of the Packery Channel. Both areas will use water control structures that will allow the water level within the PAs to be manipulated to provide ponding that would promote the settling of fine-grained material. During dredging operations, the quality of the TSS in the effluent will be regulated by adjusting either the outlet weir or the rate of dredging, as appropriate. Contract specifications will require the contractor to monitor effluent quality and ensure that dredging operations will not result in TSS levels that exceed 300 mg/l.

Placement Area Nos. 2 and 3 will be used to receive material that is mechanically excavated. Therefore, there will be no return water associated with these areas. Some incidental water may be entrained during mechanical dredging from the channel between Stations 136+50 and 140+53; but, the amount of water thus removed is considered to be *de minimis*. This material will be placed into PA No.3.

Placement Area Nos. 4S and 4N are unconfined beach placement areas. Material will be discharged directly onto the beach for nourishment purposes. Small temporary retaining dikes will be constructed to help hold the material. No water control structures will be used in these areas. Additional information and discussion of these beach placement areas is presented in the BA.

The boundary of the Mollie Beattie Habitat Community (MBHC) that appears in the DEIS was provided by the General Land Office (GLO) during development of the DEIS. We have requested an accurate map and legal description from GLO, and will correct all depictions and references to MBHC in the FEIS. Although our project modeling indicates there will be minimal or no secondary impacts to MBHC, a Memorandum of Understanding (MOU) requiring monitoring and potential future mitigation of MBHC has been signed by the City of Corpus Christi (City) and GLO, as the lead state agency and land-owner representing the MBHC Management Team (Encl. 3). Both the Mitigation Plan and MOU have been attached to the City's GLO lease for project lands, and both will be incorporated into the FEIS.

As a result of resource agency meetings and coordination during this last year, the following mitigation ratios (mitigation acres:acres of impact) have been agreed to:

Submerged aquatic vegetation (SAV)	3:1
High salt marsh	1:1
Low salt marsh	2:1
Tidal flats	1:1

In addition, Shamrock Island, located north of the Packery Channel project area, was agreed upon as an appropriate mitigation site. A mitigation plan is attached and will be incorporated into the FEIS (Enclosure 4). The mitigation plan addresses all direct construction impacts resulting from channel and placement area construction.

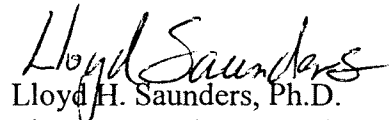
Delineation of habitat types was performed through use of aerial photographs that were extensively ground-truthed. When an issue was made of this at our initial resource agency meeting on July 8, 2002, a field trip to verify the accuracy of habitat mapping was planned and conducted on July 11, 2002. Representatives of U.S. Fish & Wildlife Service, Texas Parks & Wildlife Department, and GLO accompanied PBS&J and Corps staff to verify habitat mapping. Mapping of the entire channel to the crash basin was reviewed in the field. This included all areas of MBHC that will be impacted by the channel project. The extent and identification of habitat types were verified to the satisfaction of all members present. We believe the habitat delineations presented in the DEIS and acreages calculated are accurate.

In addition to verification of habitat types and acreages, the mapping of CH units TX-6 and TX-7 was more accurately plotted, and only land possessing actual critical habitat constituent elements was included in the calculation of loss of critical habitat resulting from channel construction. As a result of this more accurate delineation, CH loss was revised from the 6.2 acres reported in the original BA, to 1.5 acres of impact reported in the Revised BA.

We trust that this additional information will assist you in your review of the Revised BA. In the Revised BA we have identified conservation measures to avoid, minimize, or mitigate impacts to threatened or endangered species and critical habitat that may result from construction of Packery Channel, and request your Biological Opinion identifying any additional reasonable and prudent measures that may be appropriate. In your review we request that consideration be given to the fact that this project will result in beneficial affects to threatened and endangered species including: creation of foraging habitat for sea turtles along the jetties, a new channel between the Gulf and the rich seagrass beds of the Laguna Madre that will facilitate movement of sea turtles between these habitats, and beach nourishment of 46.1 acres of beach north and south of the proposed jetties, including 24.6 acres of piping plover critical habitat. Without the proposed beach nourishment, existing erosion of these beaches would continue, and critical habitat would ultimately be lost.

Please contact Ms. Carolyn Murphy at 409/766-3044 if additional information is needed or if you have additional questions. Your prompt response will be appreciated.

Sincerely,


Lloyd H. Saunders, Ph.D.
Planning, Environmental,
And Regulatory Division

Enclosure 1, the revised BA, was included with the USACE response letter, however see Appendix F for this document.



August 23, 2002

Ms. Carolyn Murphy, Chief
Environmental Section
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

RE: North Padre Island Storm Damage Reduction and Environmental
Restoration Project (Packery Channel)
City of Corpus Christi Project No. 5122
Packery Channel MMPA – Dredge Site Alignments

Dear Ms. Murphy:

Forwarded is the layout for the MMPA. The disposal limits were outlined on the PBS & J photo/drawing that you provided. This PA will be made up of the two cells encompassing a total of approximately 10.0 acres of upland, high-salt marsh and mud flats. To accommodate the maintenance material, the perimeter dike will be built with a top elevation of 20 feet from the ground elevation, maintaining a 4-foot top width and 3 to 1 slopes. This site will accommodate anticipated maintenance dredging of 15,000 CY of material every 5 years for the 50-year project life, for a total capacity of 150,000 CY. Two (2) 30-foot wide construction access corridors are included for equipment access from Packery Channel.

Sincerely,

Angel R. Escobar, P.E.
Director of Engineering Services

ARE:rr

Encls.

cc: Col. Leonard d. Waterworth, Corps of Engineers
Carl M. Anderson, P.E., Corps of Engineers
Herbie Maurer, Corps of Engineers
Manuel Freytes, GLO Regional Director

Value Engineering Study

Since coordination of the DEIS in June 2002, there have been minor project design modifications. The project description provided in this Section varies from the project description in the DEIS because it incorporates changes resulting from a Value Engineering (VE) Study conducted for the project. Changes from the DEIS project description resulting from the VE study are summarized below.

The VE Study was initiated in April 2002 to determine if the cost of the project could be reduced without affecting the engineering soundness of the design. Several proposals were implemented with the final design changes adopted in November 2002. The VE study resulted in a reduction in project costs of approximately \$4.75 million. The following proposals were implemented into the project design:

1. The concrete bulkheads and sheet pile walls of Placement Areas 1, 2 and 3 were replaced with sand embankments. Slopes are protected with geotextile fabric and concrete cellular mattresses.
2. The landside jetty cross section was reduced in width approximately 36 feet.
3. The jetty crown width is reduced from 16 feet to 10.5 feet.
4. The jetty walkway was redesigned to 24 inch thick concrete slabs integrated into the jetty to replace the top twenty four inches of jetty rock.
5. The jetty cross section was tapered from the Gulf to the land section, reducing the amount of rock required.
6. The SH 361 bridge fendering system was eliminated. The bridge will be protected by riprap.
7. Placement Area 1 was resized from 20.2 acres to 14.3 acres to keep the levee out of the 1000-foot dune line.

The VE changes in project design address engineering and construction of the project with the intent of identifying cost-saving measures, and do not result in a change in overall project footprint, additional environmental impacts, new project features, or significant project modification.

Enclosure 4, MOU for the MBHC was included with the USACE response letter, however see Appendix A for this document.

North Padre Island Storm Damage Reduction and Environmental Restoration Project Mitigation Plan

- I. To mitigate for the subject project, the City of Corpus Christi (city) will construct or cause to be constructed breakwater(s) that will assist in protecting Shamrock Island and will create or cause to be created a approximately 15.6 acres of submerged aquatic vegetation (SAV). Construction of the breakwater(s) must be concurrent with the construction of Packery Channel.
- II. The City shall be responsible to the Texas General Land Office and the School Land Board for successful completion of all of the requirements of this Mitigation Plan.
- III. The city will partner with and work through the Coastal Bend Bays and Estuaries Program (CBBEP) to perform the required mitigation. The city will deposit \$1,250,000 with the CBBEP to fund the required mitigation. As a condition of the transfer of funds to the CBBEP, the city will secure the written commitment of the CBBEP to be bound to all the terms, conditions, and requirements of this Mitigation Plan. This funding will be for the exclusive use of protecting and enhancing Shamrock Island, including the creation of 15.6 acres of SAV. Once the project is determined by the GLO to be successful, any remaining funds will be used to further enhance Shamrock Island and adjacent submerged state owned land.

The City will require that wherever possible, the CBBEP will seek matching or other funds to further protect or enhance the Island.

- IV. A team consisting of the Nature Conservancy, CBBEP, GLO, and applicable state and federal resource agencies (team) will provide input into the project. All recommendations of the team will be a consensus of the team, and must be approved by the GLO and Nature Conservancy as landowners. Working with this team, the CBBEP will undertake appropriate studies to determine the correct pattern of work to be undertaken. Areas of work to be considered will include, but not be limited to, protection of the North end of the Island, protection of the South end of the Island, re-nourishment of the feeder beach, and possible repair and/or upgrade of the existing geotube. One requirement for successful completion of the project will be the creation of 15.6 acres of SAV.
- V. The entire \$1,250,000 will be held and utilized solely for the protection and enhancement of Shamrock Island and adjacent state owned submerged land. The CBBEP will undertake those actions recommended by the team after review of the studies to protect and enhance Shamrock Island. In no event will the cost of project management, alternatives analysis, engineering and design, permitting, and construction oversight exceed 20% of the funds deposited.

EXHIBIT E

- VI. The CBBEP with the consensus of the team and with the approval of the GLO and the Nature Conservancy will determine specific locations of the breakwater(s), type of breakwater(s), and habitat creation.

If the breakwater(s) is/are constructed of rock, the footprint of the breakwater(s) will be considered habitat creation, provided the GLO and Nature Conservancy approve the configuration.

- VII. The created SAV habitat will be allowed to naturally vegetate for 2 full growing seasons after the breakwater is constructed. If after three years, 50% of the required SAV mitigation has naturally vegetated, the CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 50% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

If after five years, 70% coverage of the required SAV mitigation has not been achieved; CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 70% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

It is understood and agreed by all parties that the city's financial contribution shall be limited to \$1,250,000 and the CBBEP's actions to plant seagrass, if required, shall come from this amount.

- VIII. The CBBEP, on behalf of the city, will submit annual reports beginning in year 3 to the GLO indicating the percent coverage and acreage of SAV, and acreage and habitat of Shamrock Island.

- IX. The project will be determined to be a success when the breakwater(s) has/have been installed, approximately 15.6 acres of SAV has been created, and no significant amount of habitat (excluding open water fish habitat) has been lost on Shamrock Island. There may be some changes in habitat type on Shamrock Island resulting from reduction of wave energy reaching the island, and this will not cause the project to be deemed unsuccessful.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; Fax 570-5517
<http://caldera.sero.nmfs.gov>

SEP 30 2002

F/SER3:DLK:mdh

Dr. Lloyd H. Saunders
Chief, Planning, Environmental and Regulatory Division
Galveston District, Corps of Engineers
Department of the Army
P.O. Box 1229
Galveston, TX 77553-1229

Dear Dr. Saunders:

This correspondence is in reply to the letter and draft environmental impact statement with attached biological assessment (DEIS), received June 19, 2002, from the U.S. Army Corps of Engineers (COE), Galveston District. The COE has requested section 7 consultation from the National Marine Fisheries Service (NOAA Fisheries), pursuant to the Endangered Species Act of 1973 (ESA). The project is the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Pub.L. 106-53). The NOAA Fisheries' consultation number for this project is I/SER/2002/00678; please refer to this number in future correspondence on this project.

The project consists of the construction of a channel between the Laguna Madre and the Gulf of Mexico across North Padre Island, Nueces County, Texas. This channel will be referred to as the Packery Channel. Dredging of the channel will provide sand for nourishing the eroding beach at Packery Channel that will reduce potential future storm damage to North Padre Island. This project will also create a water exchange pass between Laguna Madre and the Gulf of Mexico that will periodically reduce hypersaline conditions in Laguna Madre, thereby helping to restore the ecosystem. The project includes dredging a 12-foot-deep by 116-foot-wide channel to connect the existing Packery Channel to the Gulf of Mexico and dredging the existing channel to a depth of -7 feet (mean sea level) and a width of 80 feet. Dredged sands will be placed on the beach south of the proposed jetties. Maintenance dredging is expected to occur every 5 years.

ESA listed species under the purview of NOAA Fisheries which potentially occur in the project area include the green (*Chelonia mydas*), loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), and hawksbill (*Eretmochelys imbricata*) sea turtles. NOAA Fisheries is responsible for these species at sea, while the U.S. Fish and Wildlife Service manages listed sea turtles on land. No critical habitat has been designated for these species within the project area.

The DEIS states that the means of dredging to be used for this project has not yet been determined and the plan calls for the use of either cutterhead dredges or hopper dredges with turtle-deflecting drag heads, screens, and turtle observers. However, in a September 24, 2002, telephone conversation with Carolyn Murphy of the Galveston District COE, NOAA Fisheries was informed that hopper dredging will not be utilized for the creation or maintenance of the channel. This was reiterated in e-mail correspondence on the same date. Cutterhead dredges, unlike hopper dredges, have not been demonstrated to take sea turtles. Based upon this review, NOAA Fisheries believes that the proposed action is not likely to adversely affect any listed species under our purview.

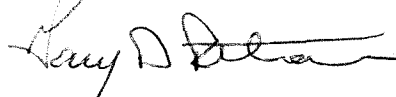


This concludes the COE's consultation responsibilities under section 7 of the ESA for the proposed actions for federally-listed species, and their critical habitat, under NOAA Fisheries' purview. Consultation should be reinitiated if there is a take, new information reveals impacts of the proposed actions that may affect listed species or their critical habitat, a new species is listed, the identified action is subsequently modified, or critical habitat designated that may be affected by the proposed activity.

Pursuant to the essential fish habitat consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)(2) and 50 CFR 600.905-.930, Subpart K), the NOAA Fisheries' Habitat Conservation Division (HCD) is being copied with this letter. The HCD biologist for this region is Rusty Swafford. If you have any questions about consultation regarding essential fish habitat for this project, please contact Mr. Swafford at (409) 766-3699.

If you have any questions, please contact Dennis Klemm, fishery biologist, at the number above or by e-mail at Dennis.Klemm@noaa.gov.

Sincerely,



for,

Joseph E. Powers, Ph.D.
Acting Regional Administrator

cc: F/PR3
F/SER42- R. Swafford

File: 1514-22 f.1 Texas
O:\section 7\informal\COE North Padre Island.wpd



REPLY TO
ATTENTION OF.

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 24, 2003

Environmental Section

Dr. Joseph E. Powers
Acting Regional Administrator
National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Dr. Powers:

Reference is made to your correspondence of September 30, 2002, File No. 1514-22f.1 Texas, concerning the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel). In your letter you concur with our Biological Assessment that the project is not likely to adversely affect any listed species under your purview.

As a result of consultation with U.S. Fish and Wildlife Service (FWS), a Revised Biological Assessment has been developed to provide additional project information and consideration of terrestrial species (Encl. 1). In addition, a placement area (PA) coordinated in the DEIS has changed (Encl. 2), minor project design revisions have occurred as a result of a Value Engineering (VE) study (Encl. 3), a revised mitigation plan has been developed (Encl. 4), and a Memorandum of Understanding (MOU) concerning monitoring of Mollie Beattie Habitat Community (MBHC) has been negotiated (Encl. 5). These project developments are briefly discussed below, and are presented in more detail in the enclosures.

A new placement area (PA) has been identified to replace the MMPA described in the DEIS and is described in Enclosure 2. The PA will be made up of two cells encompassing approximately 10 acres of upland, high salt marsh, and tidal flats. Levees will be approximately 20-feet tall with 3 to 1 side slopes. This site will accommodate anticipated maintenance dredging of 15,000 cy of material every 5 years for the 50-year project life, for a total capacity of 150,000 cy. Two 30-foot construction access corridors are included for access from Packery Channel.

Section 1.2 of the DEIS, project description, has been modified as a result of a Value Engineering (VE) Study conducted in the fall of 2002. A revised project description and summary of changes made as a result of the VE Study is Enclosure 3.

The VE changes address the engineering and construction of the project with the intent of identifying cost-saving measures, and result in only minimal changes in project footprint or environmental impacts. These changes do not result in significant project modification.

As a result of resource agency meetings and coordination during this last year, the following mitigation ratios (mitigation acres:acres of impact) have been agreed to:

Submerged aquatic vegetation (SAV)	3:1
High salt marsh	1:1
Low salt marsh	2:1
Tidal flats	1:1

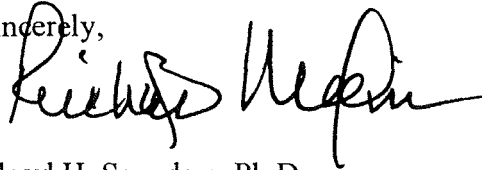
In addition, Shamrock Island, located north of the Packery Channel project area, was agreed upon as an appropriate mitigation site. A mitigation plan is attached and will be incorporated into the FEIS (Encl. 4). The mitigation plan addresses all direct construction impacts resulting from channel and placement area construction.


Although our project modeling indicates there will be minimal or no secondary impacts to MBHC, a Memorandum of Understanding (MOU) requiring monitoring and potential future mitigation of MBHC has been signed by the City of Corpus Christi (City) and General Land Office (GLO), as the lead state agency and land-owner representing the MBHC Management Team (Encl. 5). Both the Mitigation Plan and MOU have been attached to the City's GLO lease for project lands, and both will be incorporated into the FEIS.

In conclusion, we are providing these project revisions to you for your review. In our opinion, none of these changes will result in impacts to marine threatened and endangered species. Please note that as a result of further project design development, we have revised the project description and BA to reflect that no hopper dredging will be conducted for the construction or maintenance of this project.

Should you have concerns about any of these project revisions or require additional information, please contact Ms. Carolyn Murphy at 409/766-3044 at your earliest convenience.

Sincerely,



 Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental,
and Regulatory Division

Enclosure 1, The revised BA, was included with the USACE response letter, however see Appendix F for this document.



August 23, 2002

Ms. Carolyn Murphy, Chief
Environmental Section
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

RE: North Padre Island Storm Damage Reduction and Environmental
Restoration Project (Packery Channel)
City of Corpus Christi Project No. 5122
Packery Channel MMPA – Dredge Site Alignments

Dear Ms. Murphy:

Forwarded is the layout for the MMPA. The disposal limits were outlined on the PBS & J photo/drawing that you provided. This PA will be made up of the two cells encompassing a total of approximately 10.0 acres of upland, high-salt marsh and mud flats. To accommodate the maintenance material, the perimeter dike will be built with a top elevation of 20 feet from the ground elevation, maintaining a 4-foot top width and 3 to 1 slopes. This site will accommodate anticipated maintenance dredging of 15,000 CY of material every 5 years for the 50-year project life, for a total capacity of 150,000 CY. Two (2) 30-foot wide construction access corridors are included for equipment access from Packery Channel.

Sincerely,

Angel R. Escobar, P.E.
Director of Engineering Services

ARE:rr
Encls.

cc: Col. Leonard d. Waterworth, Corps of Engineers
Carl M. Anderson, P.E., Corps of Engineers
Herbie Maurer, Corps of Engineers
Manuel Freytes, GLO Regional Director

Value Engineering Study

Since coordination of the DEIS in June 2002, there have been minor project design modifications. The project description provided in this Section varies from the project description in the DEIS because it incorporates changes resulting from a Value Engineering (VE) Study conducted for the project. Changes from the DEIS project description resulting from the VE study are summarized below.

The VE Study was initiated in April 2002 to determine if the cost of the project could be reduced without affecting the engineering soundness of the design. Several proposals were implemented with the final design changes adopted in November 2002. The VE study resulted in a reduction in project costs of approximately \$4.75 million. The following proposals were implemented into the project design:

1. The concrete bulkheads and sheet pile walls of Placement Areas 1, 2 and 3 were replaced with sand embankments. Slopes are protected with geotextile fabric and concrete cellular mattresses.
2. The landside jetty cross section was reduced in width approximately 36 feet.
3. The jetty crown width is reduced from 16 feet to 10.5 feet.
4. The jetty walkway was redesigned to 24 inch thick concrete slabs integrated into the jetty to replace the top twenty four inches of jetty rock.
5. The jetty cross section was tapered from the Gulf to the land section, reducing the amount of rock required.
6. The SH 361 bridge fendering system was eliminated. The bridge will be protected by riprap.
7. Placement Area 1 was resized from 20.2 acres to 14.3 acres to keep the levee out of the 1000-foot dune line.

The VE changes in project design address engineering and construction of the project with the intent of identifying cost-saving measures, and do not result in a change in overall project footprint, additional environmental impacts, new project features, or significant project modification.

North Padre Island Storm Damage Reduction and Environmental Restoration Project Mitigation Plan

- I. To mitigate for the subject project, the City of Corpus Christi (city) will construct or cause to be constructed breakwater(s) that will assist in protecting Shamrock Island and will create or cause to be created a approximately 15.6 acres of submerged aquatic vegetation (SAV). Construction of the breakwater(s) must be concurrent with the construction of Packery Channel.
- II. The City shall be responsible to the Texas General Land Office and the School Land Board for successful completion of all of the requirements of this Mitigation Plan.
- III. The city will partner with and work through the Coastal Bend Bays and Estuaries Program (CBBEP) to perform the required mitigation. The city will deposit \$1,250,000 with the CBBEP to fund the required mitigation. As a condition of the transfer of funds to the CBBEP, the city will secure the written commitment of the CBBEP to be bound to all the terms, conditions, and requirements of this Mitigation Plan. This funding will be for the exclusive use of protecting and enhancing Shamrock Island, including the creation of 15.6 acres of SAV. Once the project is determined by the GLO to be successful, any remaining funds will be used to further enhance Shamrock Island and adjacent submerged state owned land.

The City will require that wherever possible, the CBBEP will seek matching or other funds to further protect or enhance the Island.

- IV. A team consisting of the Nature Conservancy, CBBEP, GLO, and applicable state and federal resource agencies (team) will provide input into the project. All recommendations of the team will be a consensus of the team, and must be approved by the GLO and Nature Conservancy as landowners. Working with this team, the CBBEP will undertake appropriate studies to determine the correct pattern of work to be undertaken. Areas of work to be considered will include, but not be limited to, protection of the North end of the Island, protection of the South end of the Island, re-nourishment of the feeder beach, and possible repair and/or upgrade of the existing geotube. One requirement for successful completion of the project will be the creation of 15.6 acres of SAV.
- V. The entire \$1,250,000 will be held and utilized solely for the protection and enhancement of Shamrock Island and adjacent state owned submerged land. The CBBEP will undertake those actions recommended by the team after review of the studies to protect and enhance Shamrock Island. In no event will the cost of project management, alternatives analysis, engineering and design, permitting, and construction oversight exceed 20% of the funds deposited.

EXHIBIT E

- VI. The CBBEP with the consensus of the team and with the approval of the GLO and the Nature Conservancy will determine specific locations of the breakwater(s), type of breakwater(s), and habitat creation.

If the breakwater(s) is/are constructed of rock, the footprint of the breakwater(s) will be considered habitat creation, provided the GLO and Nature Conservancy approve the configuration.

- VII. The created SAV habitat will be allowed to naturally vegetate for 2 full growing seasons after the breakwater is constructed. If after three years, 50% of the required SAV mitigation has naturally vegetated, the CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 50% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

If after five years, 70% coverage of the required SAV mitigation has not been achieved; CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 70% coverage. If recommended by the team CBBEP will plant seagrass in the areas designated by the team. Unless otherwise recommended by the team, the planting will be at a minimum of 1 sprig per 3-foot center.

It is understood and agreed by all parties that the city's financial contribution shall be limited to \$1,250,000 and the CBBEP's actions to plant seagrass, if required, shall come from this amount.

- VIII. The CBBEP, on behalf of the city, will submit annual reports beginning in year 3 to the GLO indicating the percent coverage and acreage of SAV, and acreage and habitat of Shamrock Island.

- IX. The project will be determined to be a success when the breakwater(s) has/have been installed, approximately 15.6 acres of SAV has been created, and no significant amount of habitat (excluding open water fish habitat) has been lost on Shamrock Island. There may be some changes in habitat type on Shamrock Island resulting from reduction of wave energy reaching the island, and this will not cause the project to be deemed unsuccessful.

Enclosure 5, MOU for the MBHC, was included with the USACE response letter, however see Appendix A for this document.



COMMISSIONERS

KATHARINE ARMSTRONG IDSAL
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FORT WORTH

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MARK E. WATSON, JR.
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LEE M. BASS
CHAIRMAN-EMERITUS
FORT WORTH

ROBERT L. COOK
EXECUTIVE DIRECTOR

July 26, 2002

Dr. Lloyd H. Saunders
Chief, Planning, Environmental and Regulatory Divisions
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 88553-1229

Dear Dr. Saunders,

This letter is in response to your June 6, 2002 request for comments concerning the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). The project consists of construction of a channel between the Laguna Madre and the Gulf of Mexico across North Padre Island, Nueces County, Texas, and is referred to as Packery Channel.

The U.S. Army Corps of Engineers (USACE) has been directed by Congress (through the Water Resources Development Act of 1999) to carry out the ecosystem restoration and storm damage protection project. The City of Corpus Christi will be the local sponsor. During review of the DEIS, members of your staff contacted Texas Parks and Wildlife Department (TPWD) and the other resource agencies in an effort to coordinate a meeting to discuss potential environmental concerns associated with the proposed project. Department staff participated in the subsequent July 8, 2002, July 11, 2002, and July 19, 2002 interagency meetings and site visits. A number of issues were discussed and clarified. The USACE, the consulting firm of PBS&J, and the City of Corpus Christi attended the meetings and provided additional information to the various resource agencies in attendance. Some of the issues discussed included habitat survey methodologies used to determine direct impacts, the amounts and types of habitat to be impacted, mitigation needs, and dredge disposal (placement) areas. In addition, a significant portion of the Packery Channel project located on the west side of the SH 361 Bridge is situated within the Mollie Beattie Coastal Habitat Community (MBCHC) site. The MBCHC Management Team (of which TPWD is a member) had not been consulted prior to the July 8, 2002 meeting.

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C01-01

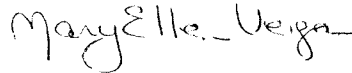
<u>Comment</u>	<u>Response</u>
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C01-01	Thank you for your comments.
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The July 8th, July 11th, and July 19th meetings have resulted in a number of issues being clarified and/or corrected. Additional information is also being provided to the resource agencies. TPWD staff will review the additional information and will be providing specific comments relative to this information and the DEIS within two weeks of the date of this letter.

TPWD staff appreciates the opportunity to comment on the DEIS for the North Padre Island Storm Damage Reduction and Environmental Restoration Project. If you have any questions, please do not hesitate to call me at (361) 825-3243 or Bob Spain at (512) 389-4635.

Sincerely,

A handwritten signature in cursive script that reads "Mary Ellen Vega". The signature is written in dark ink and is positioned above the printed name.

Mary Ellen Vega
Resource Protection Division

**Texas General
Land Office**



**David Dewhurst
Commissioner**

July 29, 2002

Dr. Lloyd H. Saunders
Chief, Planning, Environmental and Regulatory Division
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

RE: Comments on the proposed North Padre Island Storm Damage
Reduction and Environmental Restoration Project (PL106-53) Draft
Environmental Impact Statement (DEIS)

Dear Dr. Saunders:

The Texas General Land Office (GLO) appreciates the opportunity to comment on the DEIS for the proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel). Attached are the GLO comments regarding the Packery Channel project arranged by DEIS section. These comments reflect concerns that have been raised in previous GLO consultation with the City of Corpus Christi and U.S. Army Corps of Engineers – Galveston District as well as in project meetings held with state and federal resource agencies.

Please contact me at 512/475-3624 or by email at ray.newby@glo.state.tx.us if you need any additional information regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Ray Newby".

Ray Newby
Texas General Land Office

Stephen F. Austin Building

1700 North
Congress Avenue

Austin, Texas
78701-1495

512-463-5001

RN:kh

cc: Texas Parks and Wildlife Department
Texas Natural Resource Conservation Commission
U.S. Fish and Wildlife Service
National Marine Fisheries Service

C02-01

<u>Comment</u>	<u>Response</u>
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C02-01	Thank you for your comments.
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**Texas General Land Office Comments on the Draft
Environmental Impact Statement for the North
Padre Island Storm Damage Reduction and Environmental
Restoration Project (Packery Channel)**

1.1 Purpose and Need

The purpose and need statement mentions that a water exchange pass will be created to periodically reduce hypersaline conditions in the Laguna Madre for ecosystem restoration. Given that the Laguna Madre is considered one of three unique hypersaline lagoon systems on Earth, it is not clear why decreased salinity levels are needed or desired. A better justification of the need for reducing salinity levels and the anticipated benefits should be provided in the Final Environmental Impact Statement (FEIS).

C02-02

1.2.2 Placement Areas (PAs)

The effect of windblown sand on channel shoaling rates is considered to be insignificant in the DEIS based on the observation that the adjacent area is predominantly vegetated. Although there is vegetation in the area, there is also evidence of unvegetated dune blowouts in close proximity to the proposed channel. Additionally, aeolian transport of sand is a major component of the beach environment that may significantly affect channel-shoaling rates. The effects of windblown sand on channel shoaling rates and subsequent maintenance dredging requirements should be examined in greater detail in the FEIS, or contrary evidence should be presented to show reasons windblown sand shoaling rates are insignificant.

C02-03

Initial construction of the proposed channel will be a federal action, but maintenance dredging will be the responsibility of the local sponsor. The local sponsors have expressed a desire to have Packery Channel designated as a federal navigation project in order to have the U.S. Army Corps of Engineers (USACE) be the responsible party for maintenance dredging. Although the preference of the local sponsor to federalize the maintenance dredging is understandable, it raises concerns as to the financial commitment of the local entities for properly maintaining the channel. The FEIS should provide details of local funding mechanisms to properly conduct maintenance dredging over the 50-year life of the project.

C02-04

Decant water from proposed PA1 and PA2 is to be drained from the PAs and directed across the beach towards the surf zone. Dredged material decant water is usually returned to the channel being dredged. The drainage ditches across the public beach could unnecessarily raise turbidity levels in the project area and create hazardous conditions for vehicles and pedestrians on the beach, impairing access to and use of this public beach.

C02-05

The quality of dredged material suitable for beach placement is described in the DEIS as material with a fines content of 5 percent or less, but up to 30 percent if the fines fraction does not contain a significant amount of cohesive clay. The desired quality of the dredged material for beach placement should contain no more than 5 percent cohesive clay. Material with more than 5 percent cohesive clay may lead to poor drainage during

C02-06

<u>Comment</u>	<u>Response</u>
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C02-02	Please see Response to Comment C03-15.
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C02-03	<p>The DEIS addresses windblown sand and its affect on shoaling rates in the first paragraph of Section 1.2.2. The information in the DEIS is based on the semi-empirical formula of Bagnold, and the results of the modeling of shoreline erosion and sediment transport performed for Engineering design purposes. In the DEIS, a distinction is made between Reach 1 (jetties to SH 361) and Reach 2 (SH 361 to the GIWW). Over the 50-year life of the project, it is estimated that there will be 11,867,500 cy of maintenance material. Approximately 70% of that material will accumulate in Reach 1 between Stations 168+00 and 198+00, or within the jetties. The source of this material is identified as predominantly water transported in the DEIS. From the modeling, the actual break-down of aeolian/water transported material is 16,750 to 38,000 cy per year for Reach 1. Only about 30% of all maintenance material will be deposited in the other 3,000 feet of Reach 1 and Reach 2, even though this portion of the proposed Packery Channel is more than four times as long as the portion from Station 168+00 to the end of the jetties. As correctly stated in the DEIS, aeolian transport is an insignificant source of maintenance material for the portion of the channel from Station 0+00 to 168+00, including all of Reach 2. Modeling indicates for Reach 2 indicates that Aeolian transport will not contribute to Reach 2 maintenance dredging.</p>
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C02-04	<p>The local sponsor, the City of Corpus Christi, assumes all financial responsibility for project maintenance upon completion of construction under the Project Cost-Share Agreement, which is being coordinated. How the City funds its portion of the project and maintenance is not a NEPA issue.</p>
--------	---

C02-05	<p>This plan has changed. The PAs will drain into the Inner Basin. State Water Quality 401 certification has been obtained for the project and is included in Appendix C.</p>
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C02-06	<p>Only beach quality sand will be placed on the beach.</p>
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rain events and the formation of a hard crust when dried. Additionally, dredged material placement handling procedures detailing methods to reduce the amount of clay and fines on the finished beach should be added to the specifications.

Erosion control is mentioned for the PAs, but it is not defined. Will vegetation be planted? If feasible, native vegetation plantings is the preferred option.

C02-07

1.2.4 Sand Bypassing System

In 1997, the GLO commissioned a peer review panel of three qualified coastal engineers - Robert Dean, Miles Hayes, and Jacobus van de Kreeke - to review two Conrad Blucher Institute reports relating to the feasibility of opening and stabilizing Packery Channel. The resulting report, *Packery Channel Opening; Peer Review Panel Assessment*, June 13, 1997 (Peer Review Assessment), is a valuable technical evaluation of longshore sediment transport, entrance stability against shoaling, dredging requirements, jetty length, effects on the adjacent shorelines, and water response inside Corpus Christi Bay. Although it included much pertinent and unique information regarding the proposed project's environmental effects, the Peer Review Assessment was not referenced or utilized in the DEIS.

C02-08

Regarding the sand bypassing, the Peer Review Assessment states:

"A complete channel design should include an appropriate sand management program which has as a component a monitoring program and sand bypassing response element with established thresholds or 'triggers' which can be used subsequently to determine when sand transfer is required, the amounts and the removal and placement locations for the sand... It is clear that the bypassing requirements must be based on a monitoring program which will establish the timing, frequency and locations of sand removal and placement during the bypassing operations. Without the availability of such a detailed plan, a sediment management program is incomplete... Although the plans to carry out appropriate sand management programs can be sincere and well intentioned, the track record in the U.S. of various entities maintaining channels and the stability of the adjacent shorelines is not reassuring and usually results in downdrift erosion. The entity responsible for maintaining the channel needs to provide solid financial assurance that an appropriate sand management program will be carried out in perpetuity or as long as the jetties are in place."

Other than the design for a bypassing conduit under the proposed channel, little or no discussion has been held regarding the design of a sand bypassing system, littoral monitoring program, or threshold levels to trigger bypassing. Also, cost estimates for the construction and operation of a sand bypassing system have not been provided for the proposed project. The 100% design for the proposed project does present information regarding a sand bypassing system for a similar project, Indian River Inlet, Delaware, in which the initial bypassing system construction costs were \$1.7 million with annual

C02-09

<u>Comment</u>	<u>Response</u>
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C02-07	The side slopes of the channel will be covered with a geosynthetic material, a geonet, and concrete cellular mattresses to stabilize the slopes. Upon completion of the filling operations of the PAs, erosion control measures will be required for the exposed surface, such as geosynthetic material and/or planting of vegetation.
--------	--

C02-08	The peer review article is now cited in the FEIS.
--------	---

C02-09	The selection of the specific sand by-pass system will be at the discretion of the City. The Project Cost-Share Agreement under development will commit the City to maintenance of the project including the sand by-pass system. There are generally two basic pump systems for sand bypass: a suction pump or an eductor pump. The suction pump system is similar to a regular hydraulic dredge in that it has a large dredge pump connected to a pipe which is placed in the surf zone on the updrift side of the inlet. The pump sucks in water through the pipe and entrains the sand. The slurry is then pumped through pipes to the discharge point.
--------	---

The eductor pump (or jet pump) system consists of a raw water pumping system, an eductor nozzle, a booster pump, and the discharge pipe. The raw water pump pumps clean water through a hose into the eductor nozzle. The nozzle is placed in the sand in the updrift side of the inlet either in the water or above the surf zone. The water passes through the nozzle where sand is entrained into the water flow. The slurry is then pumped up to the pump house where a booster pump pumps the material through the discharge pipe to the placement area.

The jetties will be monitored by the City. Sand by-pass will be required once there has been sufficient build-up of sand to begin to approach the end of the jetties. Placement in PA 4S or 4N will be determined by need based on erosion rates, and in consultation with FWS to avoid impacts to endangered species.

operation and maintenance costs of \$290,000. Additional bypassing system design details, threshold levels, and a littoral monitoring plan should be included in the FEIS. Because of the potential financial burden on the local sponsor and the current lack of detail regarding the bypassing system for the proposed project, a financial and contractual commitment from the local sponsor should be established prior to construction of the proposed project to ensure that sand bypassing is adequately addressed.

2.0 Project Alternatives

The analysis of salinity changes and resulting habitat evaluation procedure indicate that the proposed Packery Channel project is expected to yield negligible environmental benefits. The environmental justification for this project lacks detail and should be substantiated in the FEIS.

C02-10

3.4.1 Mollie Beattie Habitat Community (MBHC)

The southern boundary for the MBHC includes a portion of Reach 2 of Packery Channel and does not stop at the northern boundary of the channel as indicated in the DEIS. The MBHC management plan team composed of representatives of GLO, Texas Parks and Wildlife Department (TPWD), U.S. Fish and Wildlife Service (USFWS), and Texas Audubon Society should be consulted with regards to potential project impacts to this sensitive area.

C02-11

3.4.5 Coastal Shore Areas/Beaches/Sand Dunes

The discussion of dunes should include information regarding their formation as a result of aeolian transport of sand from the beach. The dynamic action of wind in the beach and dune environment in the project area should be acknowledged in the FEIS as it is likely to be a factor contributing to the transport of sediment into the proposed channel.

C02-12

4.1 Environmental Setting

The DEIS mentions that "there may be a slight increase in water levels in Corpus Christi Bay during a hurricane surge because of the new channel, but the effect is not likely to be significant." A portion of the proposed channel in Reach 1 from the Inner Basin to the Gulf of Mexico will occupy an existing washover area that naturally conveys water during tropical storms and hurricanes. It appears that no analysis was performed with regard to the functionality and hydraulics of the existing washover during storm events. Therefore, it is unclear if the proposed channel will alleviate or exacerbate the impact of storm waters in the vicinity of the proposed project and Corpus Christi Bay. Additional information is needed in the FEIS to substantiate the statement regarding the behavior of the channel during storm surges.

C02-13

4.4.1 Mollie Beattie Habitat Community

As stated previously, the MBHC management plan team composed of representatives of GLO, TPWD, USFWS, and Texas Audubon Society should be consulted with regards to potential project impacts to this sensitive area. We still have concerns regarding the impact of boat traffic and hydrologic changes on this area. The local sponsor has indicated that a maritime enforcement office will be opened near the project and staffed 24 hours a day by peace officers to enforce a "no wake" zone. A financial and

C02-14

<u>Comment</u>	<u>Response</u>
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| C02-10 | Detailed information on Habitat Evaluation Procedure (HEP) analysis and hydrological modeling of salinity changes are presented in the EIS. The EIS accurately reports that the environmental benefits of the project will be small. |
| C02-11 | The boundary of MBHC identified in the DEIS was provided by GLO in materials and maps describing MBHC and the interagency Management Team established under the MBHC MOU developed by GLO. In the DEIS, the boundary is identified as the north side of the existing Packery Channel, as described in the GLO materials. Upon coordination of the DEIS, your agency commented that this boundary was inaccurate, and that in fact, the boundary extends to high land on the south side of Packery Channel. The FEIS has been revised to reflect this information. There has been extensive coordination with the MBHC Management Team, and a 5-year monitoring plan for MBHC has been developed. It is presented in Appendix A of the FEIS. |
| C02-12 | The Council on Environmental Quality (CEQ) regulation 40 CFR Part 1500.4 directs that EISs be analytical rather than encyclopedic. Section 3.4.5 of the FEIS identifies the coastal shore as a dynamic area subject to the action of winds and waves. As such, it is not necessary or desirable to belabor or document common knowledge: that aeolian transport of sediment can result in dune formation. As previously acknowledged, additional information on sediment transport modeling has been provided in the FEIS. |
| C02-13 | Hydrological modeling was conducted for Packery Channel and presented in the DEIS. Our conclusion is that opening the channel will have minimal affect on storm surge in Laguna Madre. Your attention is drawn to the following reports. The Conrad Blucher Institute prepared "Packery Channel Feasibility Study: Bay Circulation and Water Level" by Cheryl Brown and Adele Militello, Technical Report TAMU-CC-DBI-96-07. The study looked at bay circulation and water level component of a coastal processes assessment which addressed: changes in circulation and water level, changes in storm-level related water level and velocities, and currents in the proposed openings. |

The objectives of the circulation and water level component of the assessment were achieved using a two-dimensional numerical model of the hydrodynamics. The study concluded that because of the small cross-sectional area of Packery Channel relative to the cross-sectional area of the Corpus Christi Ship Channel and the volume of the bay system, the opening of Packery Channel is expected to have minimal influence on the bay water level.

Simulations indicate that there would not be substantial change in water level variations at the JFK Causeway; therefore, low-lying sections of the roadway are not expected to experience increased incidence or rate of flooding if Packery Channel is re-opened.

A peer review panel convened by GLO (Hayes, van Kreeke, and Dean, 1997) reviewed the TAMU report. The peer review panel agreed with the analysis that flooding inside Corpus Christi Bay during storms would only be minimally increased by opening Packery Channel.

C02-14 Please see Response to Comment C02-11, above. A MOU for monitoring MBHC contains a stipulation requiring the City to enforce a no-wake zone in Reach 2 of the channel (Appendix A, FEIS).

contractual commitment should be obtained from the local sponsor to ensure that the maritime enforcement office will be operated and staffed as indicated.

4.4.2 Submerged Aquatic Vegetation (SAV)

The DEIS mentions that the channel is designed to create approximately 5.4 acres of shallow shelves between the channel and bulkheads that may be suitable for SAV recruitment. The description of the proposed shelves in section 4.4.2 of the DEIS as well as Section 4.5.1.3, Essential Fish Habitat, implies that the constructed area would help mitigate for the 5.2 acres of impacts to existing SAV. We are not convinced that the constructed shelves will be occupied by SAV as the sediment characteristics, boat wakes, and reflected wave energy from the bulkheads will make the establishment of SAV difficult. It should be clarified in the FEIS that the 5.4 acres of potential SAV habitat on the constructed shelves will not be considered as mitigation for impacted SAV.

C02-15

In Appendix A of the DEIS - Texas Coastal Management Program (CMP) Compliance with Goals and Policies - the 5.4 acres of shelves are actually described as on-site, in-kind mitigation for SAV. This issue needs to be clarified or corrected in the FEIS and Appendix A to state that the constructed shelves are not considered as compensatory mitigation for impacted SAV.

4.4.4 Coastal Shore Areas/Beaches/Sand Dunes

It is our understanding that the dune protection permit issued by Nueces County for Phase I of the North Padre Island Storm Damage Reduction and Environmental Restoration Project obligates the City of Corpus Christi to fully mitigate for any damages to the dunes and dune vegetation within the geographic scope of the Dune Protection Act jurisdiction. Furthermore, the City of Corpus Christi is required to carry out mitigation for all dune and dune vegetation impacts in consultation with the GLO.

C02-16

The beach nourishment through the beneficial use of sand dredged from the proposed channel is described as having a positive impact by countering the current erosional trend of the shoreline. It should be stressed in the FEIS that this is most likely a one-time positive impact, as the presence of the jetties will possibly result in greater long-term negative erosional impacts than currently exist. Without an aggressive sand bypassing program and renourishment from maintenance dredging, the areas currently affected by erosion could experience accelerated beach loss with erosion rates in excess of current trends.

C02-17

4.11.2 Tax Increment Finance District (TIF)

The DEIS provides a good description of the intent and operation of the TIF. It is unclear if the purchase of the bonds by private developers will occur prior to construction. Purchase of the bonds prior to the start of construction would help to ensure the local sponsor's financial viability and commitment towards the project.

C02-18

<u>Comment</u>	<u>Response</u>
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| C02-15 | The Value Engineering Study conducted for the project resulted in changes in how Reach 1 of the channel will be constructed. The current project description can be found in Section 1 of the FEIS. As result of these changes, the shelves along the channel have been greatly reduced and all discussion of the shelves relative to mitigation has been removed from the document. |
| C02-16 | Dune mitigation is identified in the DEIS and FEIS. The City's dune permit and required mitigation can be found in Appendix C of the FEIS. |
| C02-17 | Beach nourishment is not a one-time positive impact. It is clearly stated in the DEIS (Section 1.2.2.4) and FEIS that approximately 200,000 cy of sand will be available annually from sand by-pass and maintenance dredging. Routine maintenance dredging is expected to occur every two years. As clearly discussed in the EIS, the sand can be placed in either PA 4S or 4N, depending on rates of erosion. Modeling indicates sufficient sand will be available from project maintenance to halt the erosion of these beaches, which is one of the project purposes. |
| C02-18 | This is not a NEPA issue. The local non-Federal sponsor is obligated to fund its part of the project and assume maintenance costs in the Project Cost-Share Agreement. |

4.11.4.3 Private Development

The discussion of anticipated secondary private development of vacant land within the TIF District does not include an analysis of potential cumulative impacts to coastal natural resource areas under the Conservative and Opportunity scenarios. The impacts from the planned development should be included in the cumulative impacts section in the FEIS.

C02-19

4.11.4.2 Proposed Dredged Material PAs

The DEIS states that "the final design of the sand bypass system associated with the channel jetties has not been completed to date; however, the design will meet all safety standards suitable for public access and enjoyment of the beaches adjacent to the jetties." It is unclear how this statement can be supported as no design (preliminary or final) of the sand bypassing system has been completed.

C02-20

4.15.4 Compensation

In general, compensatory mitigation as described in the DEIS is incomplete and inadequate as no viable mitigation plan was included. Although the general location and concept of a mitigation plan was discussed with state and federal resource agency representatives on July 8, 2002, the subsequent development of a detailed plan should be closely coordinated with the resource agencies to help ensure timely concurrence with the finalized plan.

C02-21

Compensatory mitigation is mentioned for seagrasses (3:1 ratio for the 5.2 acres of seagrass impacts) and some dunes (1.5 acres of critical dune area will be relocated for the 27.4 acres of primary/secondary dune complex impacts). The mitigation plan should include information on mitigation for all impacts to dunes and dune vegetation within the geographic scope of the Dune Protection Act jurisdiction.

Compensation is not proposed for 1.8 acres of tidal flats and 11.1 acres of coastal wetlands. Information should be included in the mitigation plan for the project for impacted tidal flats and coastal wetlands.

The 46 acres of beach nourishment for the highly erosional areas north and south of the channel is described in the "Compensation" section, but there is no identification/evaluation of and specific link to the impacts for which this "compensation" is required. We note that the proposed beach nourishment will be in an area of known historical erosion exacerbated by a seawall. It is anticipated that the project area beaches will continue to experience erosion over time. The proposed 544,800 cubic yards of sand to be placed on the beach will provide relief from coastal erosion; however, without an aggressive sediment management program with a properly operated sand bypassing system and regular renourishment from maintenance dredging, the mitigation site for beach impacts will in turn be impacted by continued erosion.

5.0 Cumulative Impacts

The projects that were evaluated as past, present, and reasonably foreseeable future actions are, for the most part, predominantly located on the north side of Corpus Christi

C02-22

<u>Comment</u>	<u>Response</u>
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C02-19	The impacts of induced development on North Padre island are presented in as much detail as possible in the DEIS (Section 4.11) and FEIS, and are based primarily on projections. The overall conclusion of the socioeconomic analysis presented in the DEIS is that North Padre island will develop with or without the proposed project. If the project is not built, the development will take longer, but it will occur.
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Because of the forecast of impacts from private development are based on projections, it is not possible to ascribe specific environmental impacts to this development. It should also be noted that much of the land that could be developed has already been modified by canal dredging, roads, and construction of utilities in anticipation of future development. Gross acreages of impact are presented in the Socioeconomic Section. This is not, however, of sufficient detail for us to address habitat specific impacts in the Cumulative Impacts analysis. We are including projects that have been permitted by the Corps in the Cumulative Impacts section of the FEIS. If future private development requires a Corps permit for construction, resource agencies will have the opportunity to review project-specific impacts at that time.

C02-20	Comment noted.
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C02-21	Project mitigation will be accomplished at Shamrock Island. This plan was coordinated and approved by State and Federal resource agencies, attached to the GLO lease to the City of Corpus Christi for project lands, and can be found in Appendix A of the FEIS. Please see Response to Comment C02-17, above, pertaining to beach nourishment.
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C02-22	Please see Response to Comment C02-19, above.
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Bay at considerable distance from the proposed project. Other projects in closer proximity to the project area should be included in the evaluation. Additionally, the proposed private development as referenced in DEIS section 4.11.2, TIF District, and described in DEIS section 4.11.4.3, Private Development, should be included in the FEIS as a reasonably foreseeable future action for evaluation under cumulative impacts.

6.2.5 Submerged Aquatic Vegetation

Consistency with the CMP goals and policies may also be enhanced by timing dredging events to minimize impacts to SAV during high growth periods.

C02-23

6.2.5 Gulf Beaches

The FEIS should include a discussion of how the proposed project will affect public access to and use of the public beaches in the project area through construction of the proposed channel and jetties.

C02-24

6.2.16 Coastal Preserves

Evaluation of the boundaries of the MBHC has revealed that the MBHC extends to the south bank of Packery Channel. Accordingly, the FEIS should note that the widening and deepening of the current channel under the proposed project will occur within the boundaries of the MBHC. In addition, the DEIS notes that secondary impacts to the MBHC include adverse impacts resulting from use of watercraft and automobiles. The FEIS should note how these secondary adverse impacts will be mitigated.

C02-25

<u>Comment</u>	<u>Response</u>
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| C02-23 | Construction dredging will impact 5.4 acres of SAV that will be mitigated. Maintenance dredging will occur primarily in the jettied entrance channel and will not impact SAV. All disposal is either beach placement or in contained PAs. There will be no impacts to SAV by maintenance dredging. |
| C02-24 | The project construction area and beach placement areas will be closed to the public during construction and maintenance operations only. Otherwise, the beach will be fully accessible to the public in compliance with the Texas Open Beaches Act on both the north and south sides of the jetties, as it is now. |
| C02-25 | When the DEIS was prepared, we were not aware of the anticipated enforcement of a no-wake zone along Reach 2, and therefore, expected additional impacts from watercraft. With the enforcement of the no-wake zone in Reach 2, and with the additional information from the modeling studies, we anticipate no indirect impacts to MBHC. The statement on automobiles was incorrect and has been revised. The City has agreed to a 5-year monitoring plan for MBHC as a requirement of their lease for project lands from GLO. This agreement can be found in Appendix A of the FEIS. |



August 9, 2002

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Dr. Lloyd H. Saunders
Chief, Planning, Environmental and Regulatory Divisions
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 88553-1229

Dear Dr. Saunders:

This letter is in response to your June 6, 2002 request for comments concerning the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). The proposed project involves the construction of a channel between the Laguna Madre and the Gulf of Mexico across North Padre Island, Nueces County, Texas, and is referred to as the Packery Channel project.

As mentioned in our July 26, 2002 letter to you, members of your staff and the consulting firm of PBS&J contacted Texas Parks and Wildlife Department (TPWD) and the other resource agencies in an effort to coordinate a meeting to discuss potential environmental concerns associated with the proposed project. Department staff participated in the subsequent July 8, 2002, July 11, 2002, and July 19, 2002 interagency meetings and site visits. A number of issues were discussed and clarified. The USACE, PBS&J, and the City of Corpus Christi attended the meetings and provided additional information to the various resource agencies in attendance. TPWD has reviewed the DEIS and the newly acquired information and offers the following comments.

Direct Habitat Impacts and Mitigation

Based on information contained in the DEIS, 5.2 acres of seagrass beds, 0.2 acres of smooth cordgrass marsh, 10.9 acres of high salt marsh, and 1.5 acres of tidal flats will be impacted as a result of the dredging and disposal activities associated with this project. The DEIS does not include mitigation for any of the aforementioned habitats except for seagrass beds. During the July 8, 2002 meeting, the USACE and local sponsor agreed to provide compensation for these habitat types at the following ratios: seagrass beds 3:1, smooth cordgrass marsh 2:1, high salt marsh 1:1 and tidal flats 1:1. This would result in the creation of 28.4 acres of estuarine habitat. The resource agencies suggested several sites

*To manage and conserve the natural and cultural resources of Texas for the
use and enjoyment of present and future generations.*

C03-01

<u>Comment</u>	<u>Response</u>
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C03-01	Comment noted. A revised project mitigation plan has been coordinated with State and Federal resource agencies. Project mitigation will occur at Shamrock Island in Corpus Christi Bay, and is described in Section 4.15 and Appendix A of the FEIS.
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where this mitigation might be performed. The USACE will be researching the viability of these potential mitigation sites. Therefore, TPWD recommends that a mitigation plan be developed through coordination with the resource agencies prior to completion of the Final Environmental Impact Statement (FEIS).

The DEIS mentions that although the proposed Packery Channel Project is expected to impact 5.2 acres of seagrass, the channel design would allow for the development of 5.4 acres of shallow water seagrass habitat. These shallow water areas would be located on the side shelves between the channel and the proposed bulkheads. During the July 8, 2002 meeting the resource agencies indicated that it was unlikely that these shelves would support seagrasses due to water velocities, currents, boat wakes, reflected wave action from the bulkheads, poor stability, etc. TPWD staff pointed out the fact that the DEIS contains several references to these shallow shelves as being compensation for the 5.2 acres of seagrass impacts. The USACE stated that the shelves were never to be considered as mitigation and would be making the appropriate corrections in the FEIS.

The DEIS also states that seagrasses could be planted in a beneficial use (BU) site which would be located on the northern end of Corpus Christi Bay. The Corpus Christi Ship Channel-Channel Improvement Project may result in the construction of several BU sites, however, that particular project is still in the planning and feasibility stages and has not been authorized yet. The resource agencies provided several reasons why transplanting seagrasses into one of the BU sites would not be considered as appropriate mitigation for the Packery Channel projects. The USACE agreed to remove references regarding the BU sites from the FEIS and will focus on developing an appropriate mitigation plan for the Packery Channel Project.

The USACE is currently evaluating several mitigation options, including excavating 28.4 acres of the Coyote Island site in order to create estuarine habitat. TPWD staff would like to offer another potential mitigation option. This mitigation option would involve the acquisition and preservation of land. This property is located immediately adjacent to the southern side of Packery Channel (on the west side of the SH 361 Bridge). The shoreline portions of this property contain smooth cordgrass marsh and seagrass beds. The upland areas contain small dunes with native barrier island grasslands and a significant amount of live oak-red bay habitat. The live oak habitat is extremely important for bird life and particularly for neotropical migratory birds. This area is well known among birders as one of the State's premier birding sites during migration. If the other options currently being considered for mitigation are proven to be unfeasible, then TPWD staff would like the acquisition and preservation of this diverse and ecologically significant parcel of land to be considered as a mitigation option.

C03-02

C03-03

C03-04

<u>Comment</u>	<u>Response</u>
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C03-02	The discussion of the shelves has been revised.
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C03-03	Please see Response to Comment C03-01, above.
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C03-04	Please see Response to Comment C03-01, above.
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Dr. Lloyd H. Saunders
Page 3

Mollie Beattie Coastal Habitat Community

Several sections of the DEIS identify the southern boundary of the Mollie Beattie Coastal Habitat Community (MBCHC) site (Reach 2) as being the northern shoreline of Packery Channel. The MBCHC site (which encompasses State Tracts 59 and 60) extends to the southern shoreline of Packery Channel. The boundaries of the MBCHC should be corrected in the FEIS. In addition, the DEIS incorrectly identifies the members of the MBCHC Management Team. The MBCHC Management Team is represented by the Texas General Land Office, U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, and the National Audubon Society.

C03-05

The MBCHC Management Team met on July 31, 2002 to discuss the Packery Channel Project. A number of issues were discussed including potential indirect impacts and habitat conversion as well as the need for monitoring and contingency plans. The MBCHC Management Team is currently developing a written response and will be providing specific team comments and recommendations in the near future. During the July 8, 2002 meeting, the City of Corpus Christi (local sponsor) was agreeable to conducting baseline surveys, monitoring, and developing a contingency plan to address the management team's concerns.

C03-06

Potential Indirect Habitat Impacts

The project area (Reach 2) located on the west side of the SH 361 Bridge currently contains many diverse and ecologically sensitive habitat types such as seagrass beds, emergent marsh, and tidal flats. As discussed during the July 8, 2002 meeting, TPWD staff and the other resource agencies are concerned about potential scouring, erosion, sedimentation, boat wake action, increased use of the area, etc. and the effects that these factors may have on the habitat types. TPWD staff will work closely with the other members of the MBCHC Management Team in developing specific recommendations regarding baseline surveys and future monitoring needs as well as a contingency plan to address impacts should they occur. Although the MBCHC does not extend all the way to the GIWW, TPWD recommends that the surveys, monitoring, and contingency plan be developed to apply to all of the State's natural resources which could be impacted by the Packery Channel Project. Specifically, TPWD staff is concerned about potential scouring or channelization which might occur at the 90-degree bend in the existing channel. Any channelization in this area would result in seagrass impacts. TPWD recommends that the aforementioned baseline surveys, monitoring needs, and contingency plans be developed through coordination with the MBCHC Management Team prior to completion of the FEIS.

C03-07

<u>Comment</u>	<u>Response</u>
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| C03-05 | The description of the Mollie Beattie Habitat Community (MBHC) that appears in the DEIS was provided by GLO. Upon review of the DEIS, GLO commented that the description was inaccurate, and provided a new description of the extent of the area. The boundary of MBHC and composition of the Management Team has been corrected in the FEIS. |
| C03-06 | A Memorandum of Understanding for monitoring potential indirect project impacts to MBHC has been negotiated between the City of Corpus Christi and GLO. It can be found in Appendix A of the FEIS. |
| C03-07 | Please see Response to Comment C03-06, above. |

Dredged Material Placement Areas

The DEIS indicates that a 7.5-acre upland disposal area (MMPA), which is to be located at Packery Channel Park, will be used for future maintenance material (50-year plan) generated from the channel located on the west side of the SH 361 Bridge. By letter dated June 17, 2002, the City of Corpus Christi has stated that they will no longer be using any portion of Packery Channel Park for their dredge disposal.

C03-08

During the July 8, 2002 meeting, the USACE and the City of Corpus Christi discussed dredge material placement plans for the entire project. Based on this information, it appears that all of the original dredged material (from both the east and west sides of the bridge) will either be placed on the beach for beach nourishment or mixed and placed behind the proposed bulkheads on the east side of the SH 361 Bridge. These bulkheads will extend parallel to the basin and a portion of the channel. The placement areas behind the bulkheads (PA 1, PA 2, and PA 3) will be capped off. TPWD is of the understanding that PA 2 will have a parking facility constructed on it once it is capped off. PA 1 and PA 3 will be capped off but no further information is provided regarding future use. The FEIS should include details regarding how these placement areas will be stabilized and used in the future.

C03-09

All of the maintenance material generated from the east side of the SH 361 Bridge will be used for beach nourishment. All of the maintenance material from the channel on the west side of the bridge (from the bridge to the bend in the channel) will be placed on the beach for beach nourishment. Only the maintenance material which will be generated from the bend in the channel to the GIWW will be silty enough to require some other method of disposal. According to the USACE and City's calculations, approximately 15,000 cubic yards of maintenance material will be generated from this reach every 5 years. The USACE and the City of Corpus Christi are currently working with the Texas Department of Transportation regarding several sites which may provide a suitable disposal site for this dredge material. The FEIS should clearly describe what the maintenance dredging needs will be and where the disposal area(s) will be located.

C03-10

Pipelines

The DEIS has identified a pipeline which crosses Packery Channel just south of the SH 361 Bridge. During the July 8, 2002 meeting, the City of Corpus Christi stated that there is an existing active 16-inch waterline which extends across Packery Channel. This waterline is located on the east side of the SH 361 Bridge. The waterline evidently has 5 feet of cover (below the proposed dredge depth)

<u>Comment</u>	<u>Response</u>
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| C03-08 | In response to comments on the DEIS, the MMPA at Packery Channel Park has been moved to an existing dredged material island north of Packery Channel near Station 50+00. The new MMPA is described in Section 1.2.2.5 of the FEIS. |
| C03-09 | PAs 1 and 3 will be graded and planted for erosion control. |
| C03-10 | Please see Response to Comment C03-08, above. |

and will not need to be lowered. The City does plan to place scour protection over this waterline.

C03-11

The City also stated that there is one fiberoptic cable on the east side of the SH 361 Bridge. This cable will need to be lowered. The City plans to place the fiberoptic cable in a conduit which can accommodate future utility lines. In addition, the City has indicated that there is one gas pipeline (that they know of) located on the west side of the SH 361 Bridge. They have not indicated whether this pipeline will need to be moved or lowered. TPWD recommends that all of the pipelines occurring in the project area be identified in the FEIS along with specific plans to move or lower the lines. Any habitat impacts that may occur as a result of relocating or lowering these lines should also be addressed in the FEIS.

Sand Bypass System

Although the DEIS makes reference to a proposed sand bypass system, information regarding the system's design and how it will function is lacking. Based on a 1997 Texas General Land Office commissioned peer review concerning the feasibility of opening and stabilizing Packery Channel, the peer review assessment team concluded that a complete channel design should be developed for the project. The design should include an appropriate sand management program which would also contain a monitoring program and sand bypassing response element with established thresholds. The DEIS does not reference or utilize the aforementioned peer review assessment. As stated earlier, TPWD is concerned with sediment transport into areas which contain sensitive habitat types, and therefore recommends that the sand bypass system be fully described and properly referenced in the FEIS.

C03-12

Cumulative Impacts

The cumulative impact section of the DEIS does not make reference to the various developmental projects which have, and continue, to take place on the island. The cumulative impact analysis was limited to projects which are located along the northern shoreline of Corpus Christi Bay. The projects referenced in the DEIS are located outside of the study area.

C03-13

A cumulative impact analysis should include past, present, and reasonably foreseeable future actions which are located within the project area. During the July 11, 2002 meeting, TPWD staff provided the USACE and City of Corpus Christi with a list of approximately 84 projects which were permitted through the Corps's Regulatory Program between 1992 and 2002. These projects are located within the study area. Some of the projects, such as Padre Isles (Asset Development) and Lake Padre involved impacts to several thousand acres of

<u>Comment</u>	<u>Response</u>
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C03-11	The Duke Energy pipeline is discussed in Section 4.7, among others, and the City water main and SBC fiber optic cable are discussed in Section 4.11.4.1. The water main will not require adjustment.
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C03-12	<p>The peer review article is now cited in the FEIS. The selection of the specific sand by-pass system will be at the discretion of the City. The Project Cost-Share Agreement under development will commit the City to maintenance of the project including the sand by-pass system. There are generally two basic pump systems for sand bypass: a suction pump or an eductor pump. The suction pump system is similar to a regular hydraulic dredge in that it has a large dredge pump connected to a pipe which is placed in the surf zone on the updrift side of the inlet. The pump sucks in water through the pipe and entrains the sand. The slurry is then pumped through pipes to the discharge point.</p>
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The eductor pump (or jet pump) system consists of a raw water pumping system, an eductor nozzle, a booster pump, and the discharge pipe. The raw water pump pumps clean water through a hose into the eductor nozzle. The nozzle is placed in the sand in the updrift side of the inlet either in the water or above the surf zone. The water passes through the nozzle where sand is entrained into the water flow. The slurry is then pumped up to the pump house where a booster pump pumps the material through the discharge pipe to the placement area.

The jetties will be monitored by the City. Sand by-pass will be required once there has been sufficient build-up of sand to begin to approach the end of the jetties. Placement in PA 4S or 4N will be determined by need based on erosion rates, and in consultation with FWS to avoid impacts to endangered species.

C03-13	<p>Based in part on assistance from TPWD in Corpus Christi and NMFS in Galveston, Corps of Engineers permits have been incorporated into the Cumulative Impacts section of the FEIS. The impacts of induced development on North Padre island are presented in as much detail as possible in the DEIS (Section 4.11) and FEIS, and are based primarily on projections. The overall conclusion of the socioeconomic analysis presented in the DEIS is that North Padre island will develop with or without the proposed project. If the project is not built, the development will take longer, but it will occur.</p>
--------	---

Because of the forecast of impacts from private development are based on projections, it is not possible to ascribe specific environmental impacts to this development. It should also be noted that much of the land that could be developed has already been modified by canal dredging, roads, and construction of utilities in

anticipation of future development. Gross acreages of impact are presented in the Socioeconomic section. This is not, however, of sufficient detail for us to address habitat specific impacts in the Cumulative Impacts analysis. We are including projects that have been permitted by the Corps in the Cumulative Impacts section of the FEIS. If future private development requires a Corps permit for construction, resource agencies will have the opportunity to review project-specific impacts at that time.

barrier island and associated estuarine habitats. The Padre Isles and Lake Padre projects are located in the immediate project vicinity, yet they had not been mentioned in the cumulative impact analysis. Therefore, TPWD recommends that the cumulative impact section of the DEIS be rewritten to address and document cumulative impacts within the project and study area. In addition, the proposed private development mentioned in the Environmental Consequences Section of the DEIS should be included in the Cumulative Impact Section.

The DEIS indicates that seagrasses will experience an area-wide increase and approximately 935 acres of potential seagrass habitat will be created in the beneficial use (BU) sites for the Corpus Christi Ship Channel-Channel Improvement Project. Furthermore, the DEIS concludes that "cumulative impacts due to past, existing, and reasonably foreseeable future projects, along with the proposed project, were found to produce a net positive cumulative impact in the project area." During the July 8, 2002 meeting, the resource agencies pointed out the fact that the BU sites were to be designed to allow for a diversity of elevations and habitat types and that the success of seagrass colonization is not assured. In addition, the BU sites (and most of the other examples cited in the Cumulative Impacts Section) are not located within the study area (Upper Laguna Madre). The USACE and City of Corpus Christi agreed to remove these inappropriate references and revise the cumulative impact analysis to address activities in the Upper Laguna Madre area.

Project Purpose and Need

According to the DEIS, the purpose of the project is storm damage reduction and environmental restoration. Environmental restoration would be accomplished by constructing a water exchange pass (Packery Channel) to periodically reduce hypersaline conditions in the Laguna Madre. Although the Laguna Madre is one of the most productive and unique lagoonal ecosystems in the world, the DEIS does not include any information or scientific justification as to why salinities need to be reduced in this naturally functioning ecosystem. Furthermore, the DEIS indicates that "the proposed project will result in an insignificant change in salinity of a few parts per thousand in the vicinity of the inlet and much smaller changes well into Corpus Christi Bay and the Laguna Madre. These changes are expected to have little to no effect on the system." This information does not give the reader a clear understanding of the goals and benefits of the environmental restoration component of the project. Therefore, it is recommended that the FEIS include a discussion which clearly identifies the ecological benefits and justification of this aspect of the project.

C03-14

C03-15

<u>Comment</u>	<u>Response</u>
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C03-14	Comment noted. The EIS has been revised.
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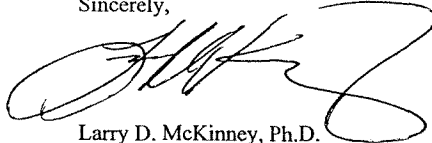
C03-15	The project at Packery Channel was authorized for construction under P.L. 106-53. The purpose of the Project as identified in the law is to construct a channel between the Gulf of Mexico and the Upper Laguna Madre that will provide restoration of the eroding Gulf beach resulting in storm damage reduction, and to create a water exchange pass that will periodically reduce hypersaline conditions in the Laguna Madre. The ecological impacts and benefits of the project are clearly stated in the FEIS.
--------	---

Dr. Lloyd H. Saunders
Page 7

TPWD staff appreciates the opportunity to comment on the DEIS for the North Padre Island Storm Damage Reduction and Environmental Restoration Project and looks forward to working with your staff on the various issues presented in this letter. If you have any questions, contact Mary Ellen Vega at (361) 825-3243 or Rollin MacRae at (512) 389-4639.

C03-16

Sincerely,



Larry D. McKinney, Ph.D.
Senior Director of Aquatic Resources

LDM:MEV:JRM:mes

cc: U.S. Fish and Wildlife Service, Corpus Christi, Texas
National Marine Fisheries Service, Galveston, Texas
Texas General Land Office, Austin, Texas
Texas Natural Resource Conservation Commission, Austin, Texas
National Audubon Society, Corpus Christi, Texas

<u>Comment</u>	<u>Response</u>
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C03-16	Thank you for your comments.
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APPENDIX C-3

COMPLIANCE/CONCURRENCE/PERMITS



City of
Corpus
Christi

July 31, 2002

Ms. Ashley Wadick
Deputy Land Commissioner
General Land Office
1700 N. Congress Avenue
Austin, Texas 78701-1495

Subject: Start of Consistency Review Time Clock – CMP #2002-0168-F6

Dear Ms. Wadick:

I am very pleased to inform you that the City of Corpus Christi and the Corps of Engineers have fully complied with the accord reached on consistency review timing.

The documentation of additional coordination was hand-delivered to your office on July 29. The proposed mitigation plan paragraph was e-mailed to your office at 5:28 pm on July 30, and you are in receipt today of a Federal Express package containing all of the public comments received on the draft Environmental Impact Statement.

We would appreciate your initiating the consistency review time clock immediately in accordance with the accord which we had reached with your office on Friday, July 26. I would like to reiterate the City of Corpus Christi's deep appreciation for your most generous consideration and assistance.

Sincerely,

David R. Garcia
City Manager

cc: The Honorable Kay Bailey Hutchison
Col. Leonard D. Waterworth, COE
Samuel L. Neal, Mayor
Tom Utter



City of
Corpus
Christi

June 17, 2002

Commissioner Joe McComb
Nueces County Commissioner Precinct 4
901 Leopard Street
Corpus Christi, Texas 78401

Re: North Padre Island Storm Damage Reduction and Environmental Restoration
Project (Packery Channel)
Maintenance Materials Placement Area

Dear Commissioner McComb:

As you know, on Friday, June 14, 2002, the Corps of Engineers released the draft Environmental Impact Statement (EIS) for Packery Channel. Included in the EIS was the statement in Section 1.2.2.5 that referred to material not appropriate for beach placement will be placed in a confined upland disposal area encompassing approximately 7.5 acres of undeveloped property. This is property owned by Nueces County and located in Packery Channel Park.

At one time the City had been in contact with Nueces County on the possibility of using this location as a placement area for maintenance material. During the process for the Dune Protection Permit, approved by the Commissioners Court on May 29, 2002, adjoining property owners voiced their concern with using this location. The City wishes to inform the County that the use of Packery Channel Park is no longer under consideration and the location referred to in the draft EIS WILL NOT be used as a disposal site. The final EIS will reflect this change. The City is actively pursuing alternate sites with the Texas Department of Transportation and General Land Office.

The City wishes to thank you for the support Nueces County has shown on making this project a top priority and their help in assuring its successful completion.

Sincerely,

A handwritten signature in black ink, appearing to read "Angel R. Escobar".

Angel R. Escobar, P.E.
Director of Engineering Services

Engineering Services



City of
Corpus
Christi

June 24, 2002

Carl M. Anderson, P.E.
Project Manager
U. S. Army Corps of Engineers
P. O. Box 1229
Galveston, TX 77553

Subject: N. Padre Island Storm Damage Reduction and Environmental Restoration
(Packery Channel)
City Project No. 5122
Nueces County Dune Protection Permit

Dear Mr. Anderson:

Enclosed is a copy of correspondence from Judge Richard Borchard, Nueces County Judge, advising the City of Corpus Christi of the approval of the permit to construct Phase I of the Packery Channel project. The letter does add conditions to the permit approval and includes a 3-year time limit for construction, and a requirement that the City fully mitigate any damage to dunes within the construction areas. The City is required to consult with the General Land Office concerning any construction in the area noted on the attached letter.

If any other information or clarification is needed for this phase of the project, please advise.

Sincerely,

Angel R. Escobar, P.E.
Director of Engineering Services

ARE:rr

Enclosure

Cc: David Garcia, City Manager



RICHARD M. BORCHARD
NUECES COUNTY JUDGE

EXECUTIVE ASSISTANTS
Steven G. Waterman
Tyner W. Little III

June 11, 2002

David Garcia, City Manager
City of Corpus Christi
P. O. Box 9277
Corpus Christi, Texas 78411

Subject: *North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel).*

Dear Mr. Garcia:

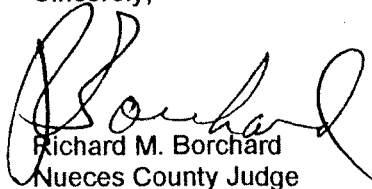
On May 29, 2002 the Commissioners' Court authorized your permit to construct Phase I of *North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel)*. The construction must be underway within three years of the permit approval date or the permit becomes void.

Your permit is authorized with the following additions:

1. The proposed activity will not materially weaken dunes, or materially damage dune vegetation, or reduce the effectiveness of any dune to protect against erosion and high wind and water.
2. Authorizing a dune protection permit for Phase I of the North Padre Island Storm Damage Reduction and Environmental Restoration Project, between the line of vegetation on the east, 1,000 feet landward of the vegetation line on the west, the wooden bulkhead of the Padre Isles subdivision on the south, and a line 800 feet north of the wooden bulkhead, and including the associated dune mitigation sites south of Zahn Road that may be outside the area described in this authorization. The City is required to fully mitigate any damage to dunes within the area, in consultation with the Texas General Land Office.

We are pleased to work with the City of Corpus Christi in the development of this project.

Sincerely,


Richard M. Borchard
Nueces County Judge

RECEIVED
JUN 13 2002
CITY MANAGER'S OFFICE





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

February 6, 2003

Colonel Leonard D. Waterworth
District Engineer, Galveston District
Department of the Army, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Colonel Waterworth:

The National Marine Fisheries Service has reviewed the information provided in the letter dated January 24, 2003, from Mr. Lloyd Saunders of your staff, concerning proposed revisions to the mitigation plan for the North Padre Island Storm Damage Reduction and Environmental Restoration Project. The proposed mitigation revisions adequately address and are consistent with the Essential Fish Habitat recommendations provided to you via our letter of July 29, 2002. This satisfies the consultation procedures outlined in 50 CFR Section 600.920, of the regulation to implement the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act. Therefore, no further consultation is required for this action.

If we may be of further assistance, please contact Mr. Rusty Swafford of our Galveston Facility at (409) 766-3699.

Sincerely,

Rickey N. Ruebsamen
Acting Assistant Regional Administrator
Habitat Conservation Division



State of Texas
Department of Transportation
Texas Department of Transportation
Austin, Texas 78701-1500

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting the Environment, Preserving the Future

February 7, 2003

Ms. Carolyn Murphy
U.S. Army Corps of Engineers (USACE)
Galveston District CESWG-PE-PR
P.O. Box 1229
Galveston, Texas 77553-1229

Re: USACE Permit Application: Environmental Assessment for North Padre Island Storm Reduction and Environmental Restoration

Dear Ms. Murphy:

Thank you for your recent letter describing the mitigation efforts of the Corps and City of Corpus Christi relating to the above project. The United States Army Corps of Engineers (Corps) was directed by Congress to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island. The City of Corpus Christi is the local sponsor for this project. The project consists of the construction of a channel between the Laguna Madre and the Gulf of Mexico across North Padre Island, Nueces County, Texas. The project goal would be accomplished by dredging a 12-foot-deep by 116-foot-wide channel to connect the existing Packery Channel to the Gulf of Mexico and by dredging the existing Packery channel to a depth of -7 feet mean sea level and a width of 80 feet. Approximately 810,000 cubic yards (cy) of material will be dredged during construction, and 544,800 cy will be placed on the beach south of the proposed jetties in order to provide sand for nourishment of the eroding beach at Packery Channel. The remainder of the dredged material will be placed in one of three placement areas or in a maintenance material placement area. Sandy maintenance material from the channel east of the SH 361 bridge will also be used for beach nourishment, and a sand bypass system will be designed to move accumulated sand from longshore drift to the downdrift side of the jetties. Over the 50-year life of the project approximately 11,000,000 cy of sandy maintenance material will be placed on the beach adjacent to the jetties. Approximately 15,000 cy of estimated maintenance dredging every five years will be placed in upland disposal sites. The local sponsor of the project is the City of Corpus Christi.

In response to the notice to interested parties for the Draft Environmental Impact Statement dated June 6, 2002 and the February 5, 2003 letter from the Corps, the Texas Commission on Environmental Quality (TCEQ) certifies that the proposed activity will not result in a violation of established Texas Water Quality Standards as required by Section 401 of the Federal Clean Water Act and pursuant to Title 30, Texas Administrative Code, Chapter 279.

USACE Permit Application: Environmental Assessment for North Padre Island Storm Reduction and Environmental Restoration

Page 2

February 7, 2003

Your February 5, 2003 letter indicates that the Shamrock Island mitigation plan is the agreed mitigation site. The TCEQ supports the protection of Shamrock Island and the surrounding aquatic resources as mitigation for this project. As described in the mitigation plan, a Submerged Aquatic Vegetation ratio of 3:1 as a result of the creation of 15.6 acres of seagrass habitat and the creation of a berm to prevent erosion of Shamrock Island have been agreed to by the resource agencies and supports our certification of the project. Any funds remaining after these objectives are met will be available for use by the interagency mitigation team to spend at the teams discretion for the types and quantities of habitats produced. Achieving a 1:1 ratio for preservation of aquatic resources is one potential item for consideration of the team.

Wetlands are protected by the Texas Surface Water Quality Standards, and play a major role in maintaining water quality. The TCEQ supports a goal of no net loss of wetland resources. To ensure achieving this goal, the TCEQ commits to participate in the interagency mitigation team as described in the mitigation plan.

No review of property rights, location of property lines, nor the distinction between public and private ownership has been made, and this certification may not be used in any way with regard to questions of ownership.

We look forward to working with you, the project sponsor and the resource agencies regarding additional related mitigation to this restoration project on the Shamrock Island project. If you require additional information or further assistance, please contact Mr. Michael D. Cowan, Director of the Water Quality Division (MC 145), at (512)239-4050 or by email at, mcowan@tnrcc.state.tx.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Margaret Hoffman", with a small "for" written above it.

Margaret Hoffman, Executive Director
Texas Commission on Environmental Quality

MH/MC/SB/eh



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

February 10, 2003

Lloyd H. Saunders, Ph.D.
Planning, Environmental, and Regulatory Division
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Dear Mr. Saunders:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your January 22, 2003 letter requesting initiation of formal section 7 consultation under the Endangered Species Act. The consultation concerns the possible effects of your proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel) on the green, loggerhead, and Kemp's ridley sea turtles and the piping plover and two of its designated critical habitat units, TX-6 (Mollie Beattie Coastal Habitat Community) and TX-7 (Newport Pass).

All information required of you to initiate consultation was either included with your letter or is otherwise accessible for our consideration and reference. We have assigned log number 2-11-02-F-255 to this consultation. Please refer to that number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). Therefore, we expect to provide you with our biological opinion no later than June 8, 2003.

As a reminder, the Endangered Species Act requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered and threatened species or destroying or modifying their critical habitats.

If you have any questions or concerns about this consultation or the consultation process in general, please feel free to contact me or Mary Orms of this office at (361) 994-9005 or by email at mary_orms@fws.gov.

Sincerely,

Allan Strand
Field Supervisor

cc: Carolyn Murphy



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

June 14, 2002

Environmental Section


Ms. Diane Garcia
Council Secretary
Coastal Coordination Council
P.O. Box 12873
Austin, Texas 78711-2873

Dear Ms. Garcia:

Pursuant to §506.20, Consistency Determination for Federal Agency Activities and Development Projects of the Texas Coastal Management Program (TCMP), I am submitting the enclosed Consistency Determination for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). Also, please incorporate by reference the Draft Environmental Impact Statement (EIS) for this project, enclosed separately. The consistency determination may also be found in the Draft EIS in Section 6.0.

The enclosed Consistency Determination and the duplicate copy in Section 6.0 is considered to be the final version. Please take the appropriate action concerning this determination. If you have any questions, please contact Mr. Sam J. Watson at (409) 766-3946.

Sincerely,


Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental
and Regulatory Division

Enclosures



Coastal Coordination Council

P.O. Box 12873 ♦ Austin, Texas 78711-2873 ♦ (512) 463-5385 ♦ FAX (512) 475-0680

Chairman

David Dewhurst
Texas Land Commissioner



Members

Michael L. Williams
Railroad Commission of Texas

Dr. William H. Clayton
Coastal Government
Representative

John Barrett
Agriculture Representative

Bob Dunkin
Coastal Business Representative

Jack Hunt
Texas Water Development Board

Robert J. Huston
Texas Natural Resource
Conservation Commission

John W. Johnson
Texas Transportation Commission

Elizabeth A. Nisbet
Coastal Resident Representative

Robert R. Stickney
Sea Grant College Program

Donald Swann
Texas State Soil & Water
Conservation Board

Mark E. Watson, Jr.
Parks & Wildlife Commission
of Texas



Diane P. Garcia
Council Secretary

Permit Service Center
1-866-894-3578

August 14, 2002

Mr. Sam Watson
P.O. Box 1229
Galveston, TX 77553

Re: **Packery Channel Consistency Review**
CMP #: 02-0238-F1

Dear Mr. Watson:

The above-referenced project was deemed administratively complete by the Coastal Coordination Council on **August 8, 2002**, and is being reviewed for consistency with the Texas Coastal Management Program (CMP). You will receive a response no later than **September 202, 2002**. If this date is a weekend or holiday, the due date is the next business day.

Your request has been assigned a CMP project number **02-0169-F1**. Please refer to this number when contacting us about this project.

Please retain this notice for your files. For all technical questions, please contact Mr. Tom Calnan at (512) 463-5100, or by mail at the Texas General Land Office, Coastal Management Program, 1700 North Congress Avenue, Room 617, Austin, Texas 78701-1495. For general questions, please contact me at (512) 463-5385.

Sincerely,

Diane P. Garcia
Council Secretary

DPG/dac

CC: Carolyn Murphy, COE
Tom Utter, City of Corpus Christi



Coastal Coordination Council

P.O. Box 1229 ♦ Galveston, TX 77553 ♦ TEL 409-663-5385 ♦ FAX 409-663-5386

Chairman

David Dewhurst

Governor, State of Texas



Members

Michael L. Williams

Representative, Texas

Dr. William H. Clayton

Coastal Conservation

Representative

John Barrett

Associate Representative

Bob Dunkin

Coastal Conservation Representative

Jack Hunt

Texas Wildlife Conservation Board

Robert J. Huston

Texas Wildlife Resources

Conservation Commission

John W. Johnson

Texas Transportation Commission

Elizabeth A. Nisbet

Coastal Conservation Representative

Robert R. Stickney

Secretary, Texas Program

Donald Swann

Texas State Soil & Water

Conservation Board

Mark E. Watson, Jr.

Mark & Wildlife Commission

of Texas



Diane P. Garcia

Executive Secretary

Planning Services Center

800-594-5385

September 20, 2002

Ms. Carolyn Murphy
Chief, Environmental Branch
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Re: Packery Channel Consistency Review
CMP #: 02-0169-F6

Dear Ms. Murphy:

Pursuant to Section 506.30 of 31 TAC of the Coastal Coordination Act, the project referenced above has been reviewed for consistency with the Texas Coastal Management Program (CMP).

It has been determined that there are no significant unresolved consistency issues with respect to the project. Therefore, this project is consistent with the CMP goals and policies.

Sincerely,

Thomas R. Calnan
Consistency Review Coordinator
Texas General Land Office

TRC/dac

cc: Kristan Clann, Permitting Assistance Group
Manuel Freytes, GLO Field Service
Tom Utter, City of Corpus Christi



REPLY TO
ATTENTION OF:

Environmental Section

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229
September 18, 2001

RECEIVED

SEP 25 2001

TEXAS HISTORICAL COMMISSION

Dr. James E. Bruseth
Deputy State Historic Preservation Officer
Division of Archaeology
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

Dear Dr. Bruseth:

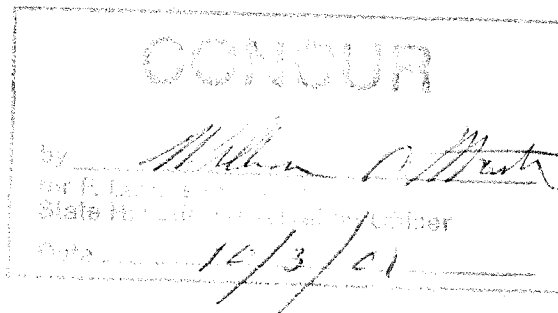
Enclosed for your review and comment is the report documenting the cultural resources inventory for the Packery Channel project in Nueces County, Texas. This report was prepared by PBS&J under contract with the U.S. Army Corps of Engineers, Galveston District and represents the initial inventory for this project. Additional terrestrial and marine survey is planned for this project. I have included PBS&J's technical proposal for the additional work for your review.

Thank you for your cooperation with this project. If you have any questions or comments, please contact Mr. Gary DeMarcay, staff archeologist, at (409)766-3878.

Sincerely,

Carolyn Murphy
Chief, Environmental Section

Enclosures



REPLY TO
ATTENTION OF.

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 14, 2002

RECEIVED

JAN 17 2002

TEXAS HISTORICAL COMMISSION

Environmental Section

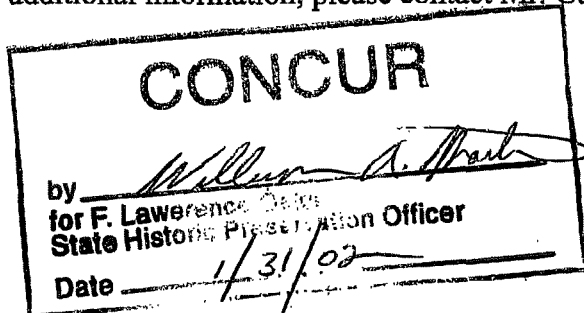
Dr. James E. Bruseth
Deputy State Historic Preservation Officer
Division of Archaeology
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

Dear Dr. Bruseth:

Enclosed is a letter report documenting the cultural resource survey for the U.S. Army Corps of Engineers, Galveston District, proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project, Packery Channel, Nueces County, Texas. Work, performed by PBS&J, included inventory for both terrestrial and underwater resources. Survey of the initial location of Placement Area No. 6 (PA 6) located site 41NU255 near the northeast corner of the placement area. Subsequently PA6 was redesigned to avoid site 41NU255 and PBS&J performed a cultural resource inventory within the boundaries of the redesigned placement area. During that inventory one biface fragment was found in a shovel test at 94cm below the surface near the water table. Six other shovel tests in the area of the biface fragment failed to find any other cultural material. It appears that the single biface fragment is an isolated artifact and not eligible to the National Register of Historic Places.

A remote sensing survey was conducted offshore of the mouth of the proposed channel, in the terrestrial area to be affected by the construction of the proposed channel, and within the existing channel. While anomalies were encountered during the remote sensing survey none of these resembled any anomalies recorded over known shipwrecks.

Therefore, we request your concurrence with a finding of No Historic Properties Affected as per 36CFR Part 800(B(4)(d)(1) for the proposed project. If you have any questions, or require additional information, please contact Mr. Gary DeMarcay, of my staff, at (409)766-3878.



Sincerely,

Carolyn Murphy
Chief, Environmental Section

Enclosure



TEXAS
HISTORICAL
COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWRENCE OAKS, EXECUTIVE DIRECTOR

July 1, 2002

Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental, and Regulatory Division
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas
77553-1229

Re: Project review under Section 106 of the National Historic Preservation Act
Draft EIS: *North Padre Island Storm Damage Reduction and Environmental
Restoration Project (PL 106-53)*
(COE-VD)

Dear Dr. Saunders,

Thank you for the opportunity to review the draft EIS referenced above. This letter serves as comment on the draft from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission. The review staff, led by Ed Baker, needs more information to complete its review.

Our office would like to review a paper copy of the draft EIS. We will then be able to review and comment on the project.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Ed Baker at 512/463-5866.**

Sincerely,

A handwritten signature in cursive script, likely belonging to F. Lawrence Oaks.

for
F. Lawrence Oaks, State Historic Preservation Officer
FLO/elb

1511 N. Colorado
78701



April 11, 2002

Carl M. Anderson, P.E., Project Manager
U.S. Army Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553

Re: City of Corpus Christi
North Padre Island Storm Damage Reduction & Environmental Restoration Project
Packery Channel Project
City of Corpus Christi Project No. 5122

Dear Carl:

Enclosed are copies of the Dune Protection Permit Application with Nueces County, and the Beachfront Construction Certificate Application with the City of Corpus Christi for the Packery Channel Project. The City's Beach Dune Committee approved the Beachfront Construction Certificate last night. This is the final approval. The Dune Protection Permit Application is scheduled to be heard by the Nueces County Beach Management Committee at 4:00pm, April 18, 2002, and mid to late May by the Nueces County Commissioner's Court for final action.

Sincerely yours,

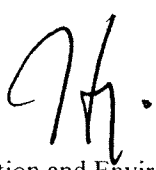
Joe Trejo, Acting Director of
Engineering Services

JT:rr

Encls. – Dune Protection Permit Application
Beachfront Construction Certificate Application

MEMORANDUM
Department of Engineering Services
Major Projects Division
City of Corpus Christi, Texas

TO: Distribution Below

FROM: Joe F. Trejo, P.E.
Acting Assistant Director of Engineering 

SUBJECT: North Padre Island Storm Damage Reduction and Environmental Restoration Project
Packery Channel
Project No. 5122
Beachfront Construction Certificate Application

DATE: April 5, 2002

Enclosed is a copy of the Beachfront Construction Certificate application for the above project. This is for your project file.

Enclosures

W/ENCLOSURES

Engineering

Randal Stivers
Joe Trejo
Rosa Ramirez

Legal

Jay Reining

Consultants

Felix Ocanas, P.E.
Jim Shiner, P.E., Shiner, Moseley & Assoc.
Mark Mazoch, URS

Government

Manual Freytes, GLO
Carl Anderson, COE

WO/ENCLOSURES

Engineering

Angel Escobar

Planning

Mic Raasch



March 19, 2002

Mr. Shawn Hardeman
Coastal Geologist
Resource Conservation Division
Texas General Land Office
1700 North Congress Avenue, Suite 617
Austin, Texas 78701-1495

Ms. Priscilla M. Hubenak
Assistant Attorney General
Natural Resources Division
Office of the Attorney General
1700 West 15th, 10 Floor
Austin, Texas 78701

RE: Beachfront Construction Certificate Application for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel)

Dear Mr. Hardeman and Ms. Hubenak:

Attached is a copy of the Beachfront Construction Certificate application for the proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel) on Mustang Island in Nueces County, Texas. The application is categorized as large-scale construction since the area of construction is over 5,000 square feet in area. The actual construction area is 280 acres including the beach nourishment area.

The City of Corpus Christi is the sponsoring local government for this public improvement project. This project is authorized by the U.S. Congress and is being constructed by the U.S. Army Corps of Engineers (USACOE). The City of Corpus Christi does not have jurisdictional control of the project over the channel, jetties and bulkheads, and assumes the USACOE is taking the project through the Texas Coastal Management Program consistency review. The City, however, can exercise preferences as to the placement of fill of beach nourishment areas and recreational facilities.

Significant federal, state, and local funds are being contributed to this \$30 million dollar project. Of that total amount, \$1,250,000 is being contributed through the Coastal Erosion Planning and Response Act by the General Land Office. The GLO awarded the funds in February 2002 and must be expended by August 31, 2003.

The Dune Protection Permit was submitted to Nueces County on March 18, 2002.

The 100% construction plans (Enclosure 4 of the application) includes excavation of the channel with construction of the jetties and bulkheads, filling behind both bulkheads, and beach nourishment. The public amenities indicated in Enclosure 2 of the application will be constructed in Phase II of the Project. These public amenities will include two public bathhouses, a four-bay public boat ramp, beach parking, and over 4,000 feet of public walkways along the new shoreline areas.

The City of Corpus Christi finds the following.

1. Portions of the proposed construction are located seaward of the Erosion Area Line. This is necessary to reestablish an entrance from the Gulf of Mexico to Corpus Christi Bay, to correct the effects of man-made changes to the bay system's hydrology through the construction and maintenance of the Corpus Christi Ship Channel at Port Aransas. The

Packery Channel
Beachfront Construction Certificate Application
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Page 2

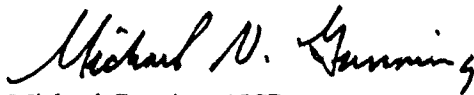
construction and maintenance of the Corpus Christi Ship Channel at Port Aransas caused the natural pass of Packery Channel to silt in. This project will reestablish a direct route for water exchange and marine life to migrate between the waters of Corpus Christi Bay and the Upper Laguna Madre and the Gulf of Mexico.

2. The proposed construction does not functionally support or depend on, or otherwise relate to existing structures that encroach on the public beach and only supports proposed structures that are integral parts of the project and public access amenities.
3. The proposed construction, within 200 feet landward of the vegetation line, does include retaining walls (jetties and bulkheads) and impervious surfaces (8 foot wide walkways in Phase II).
4. The proposed construction will not diminish public access to the Gulf beach, and will in fact, enhance public access to the Gulf beach. Significant beach nourishment and construction of protected beach parking and numerous public amenities (Phase II - including two bathhouses, a four-bay public boat ramp, and over 4,000 feet of public walkways along the new shoreline areas) will be constructed.
5. The proposed construction is consistent with the City of Corpus Christi's Beach Access Plan and applicable state law.

Pursuant to the 10 working day period for state agency review provided by the Beach/Dune Rules, the Beachfront Construction Certificate application is scheduled to be acted on by the City of Corpus Christi Concurrent Beach/Dune Committee on April 10, 2002. The City's Planning Commission serves as that Committee. Please provide comments by April 5, 2002 (FAX # 361-880-3590).

Should you have any questions or need additional information, please call Mic Raasch or me at (361) 880-3560.

Sincerely,



Michael Gunning, AICP
Director of Planning

Attachment

cc: Honorable Nueces County Judge Richard Borchard
Jay Reining, First Assistant City Attorney
Doyle Curtis, Assistant City Attorney
Mic Raasch, AICP



**DUNE PROTECTION PERMIT/
BEACHFRONT CONSTRUCTION CERTIFICATE/
MATER PLANNED DEVELOPMENT
APPLICATION FORM**

PERMIT/CERTIFICATE/MPD NO: BCC010302 BASE MAP NO.: _____

CONCURRENT BEACH/DUNE COMMITTEE MEETING: 4/10/02

DATE REC'D: 3/18/02 REC'D BY: [Signature] FILING FEE: N/A

1) (a) APPLICANT: City of Corpus Christi PHONE: (361) 880-3507 FAX: (361) 880-3501

(b) ADDRESS: 1201 Leopard St., Corpus Christi, TX 78401

(c) STATUS OF APPLICANT: Property Owner _____ Other (Specify): Lessee of GLO property

2) (a) ENGR./SURVEYOR: Felix H. Ocañas, Jr. PHONE: (361) 853-8824 FAX: (361) 806-2573

(b) ADDRESS: 4601 Cody Lane, Corpus Christi, TX 78413

(c) CONTACT PERSON: Felix H. Ocañas, Jr.

3) (a) OWNER: Texas General Land Office PHONE: (512) 463-5055 FAX: (512) 463-5304

(b) ADDRESS: 1700 N. Congress Avenue, Austin, TX 78701-1495

4) (a) PROPOSED DEVELOPMENT NAME: NORTH PADRE ISLAND STORM DAMAGE
REDUCTION AND ENVIRONMENTAL RESTORATION PROJECT

(b) ADDRESS/LOCATION: PADRE ISLAND, CC, TX (c) ACREAGE/SQ. FOOTAGE: Approx. 182 acres

(d) LEGAL DESCRIPTION: See Enclosure I

CITY LIMITS

(e) IN ☒ OUT ☐ (f) ZONING: R-1B, AT

(g) PROPOSED REZONING: N/A

LAND USE

Existing: Vacant Proposed: Park/Channel

(i) PROPOSED NO. OF PHASES: Phase I -
channel, jetties, bulkhead, filling; Phase II - park facilities

DURATION OF CONSTRUCTION

From: Dec. 2002 To: Dec. 2004

PROP. NO. OF STRUCTURES/RESIDENTIAL UNITS

Habitable: N/A Amenity: Recreational Facilities

NO. OF PARKING SPACES

Existing: 0 Proposed: 945

OPEN SPACE

Existing: 569 acres/100% Proposed: 15.0 acres 3%

WATER SERVICE:

() Water Well
(X) City Water
() Other - Specify: _____

SEWER SERVICE:

() Septic System
(X) City Sewer
() Other - Specify: _____

NOTE: Page 1 of 3. If more space is needed on any item, attach separate sheet(s) with corresponding reference numbers and letters.
(One additional sheet added).

5) I certify that the information provided herewith is accurate and correct.

[Signature] 03/18/02
FOR Angel R. Escobar, P.E. Date: 3/18/02
(Applicant's Signature)

[Signature]
Felix H. Ocañas, Jr., P.E., #33006 Date: 3/18/02
(Engineer's/Surveyor's Signature and license number)

PERMIT/CERTIFICATE/MPD APPLICATION CHECKLIST:

Applicants shall submit the following:

- ☒ 10 complete copies of application.
- ☒ Floor plans and elevation views of structures proposed to be expanded or constructed. (Encl. 2)
- ☒ Description of any existing or proposed walkways or dune walkovers on the tract. (Encl. 2) *(Additional sheet)*
- ☒ Grading and layout plan identifying all existing and proposed structures and paved areas, elevations (in reference to NOAA datum), existing contours of the project area and proposed contours for the final grade (minimum 2 foot contour intervals required for existing and proposed contours), Dune Protection Line, Erosion Area Boundary, Vegetation Line, Mean High Tide Line, and all FEMA flood zone boundaries. (Encl. 2)
- ☒ Photographs of the site which clearly show the current location of the vegetation line and existing dunes on the tract. (Encl. 2)
- ☒ Effects of the proposed activity on the beach/dune system which cannot be avoided should the proposed activity be permitted, including, but not limited to, damage to dune vegetation, alteration of dune size and shape, and changes in dune hydrology. (See Nueces County Dune Protection Permit Application)
- ☒ Comprehensive mitigation plan which includes a detailed description of the methods and respective timeframes which will be used to avoid, minimize, mitigate and/or compensate for any adverse effects on dunes or dune vegetation including use of non-indigenous vegetation. (See Nueces County Dune Protection Permit Application)
- ☒ N/A Proof of financial capability to mitigate or compensate for adverse effects on dunes and dune vegetation, or to fund eventual relocation or demolition of structures.

Applicants shall submit an accurate map or plat of the site identifying the:

- ☒ a. Site by its legal description, including, where applicable, the subdivision, block, and lot and city limit lines. (Encl. 1)
- ☒ b. Location of the property lines and a notation of the legal description of adjoining tracts. (Encl. 1)
- ☒ c. Location of the structures, the footprint or perimeter of the proposed construction on the tract. (Encl. 2)
- ☒ d. Proposed roadways and driveways and proposed landscaping activities on the tract. (Encl. 2)
- ☒ e. Location of any seawalls or any other erosion response structures on the tract and on the properties immediately adjacent to the tract (Encl. 4)
- ☒ f. Location and extent of any man-made vegetated mounds, restored dunes, fill activities, or any other pre-existing human modifications on the tract. (Encl. 4)
- ☒ g. Development name, north point, scale, date, vicinity sketch or location map and direction of prevailing breeze. (Encl. 4)
- ☒ h. Location, width and name of existing and proposed streets, blocks, lots, alleys, and easements with principal dimensions, or other significant features within 200 feet of development. (Encls. 2 and 4)
- ☒ i. General plan of stormwater drainage indicating location and direction of flow. (Encls. 2 and 4)
- ☒ j. Location and depth of existing and proposed water areas and wetlands (as determined by U.S. Corps of Engineers) and other significant land and water feature within 200 feet of development. (Encls. 2 and 4)

For all proposed large-scale construction, applicants shall submit the following items and information:

- ☒ N/A If the tract is located in a subdivision and the applicant is the owner or developer of the subdivision, a certified copy of the recorded plat of the subdivision, or, if not a recorded subdivision, a preliminary plat of the subdivision certified by a licensed surveyor, and a statement of the total area of the subdivision in acres or square feet.
- ☒ N/A Alternatives to the proposed location of construction on the tract or to the proposed methods of construction which would cause fewer or no adverse effects on dunes and dune vegetation or less impairment of the beach access.
- ☒ X The proposed activity's impact on the natural drainage pattern of the site and adjacent lots. (Encl. 4) See drawings C-10 and S-8.

For all proposed construction (large- and small-scale), if applicants already have the following items and information, the applicant shall submit, in addition, the other information required above:

- ☒ X A copy of a site plan of the proposed construction. (Encls. 2 and 4)
- ☒ X A copy of a topographical survey of the site (minimum 2-foot contour intervals) (Encl. 2)
- ☒ X The most recent local historical erosion rate date (as determined by the University of Texas at Austin, Bureau of Economic Geology) and the activity's potential impact on coastal erosion.
- ☒ X A copy of the FEMA "Elevation Certificate." Design of maintenance building and other structures not completed. Not enough information is available to complete certificate. Certificates to be submitted at a later date.

PERMIT/CERTIFICATE/MPD APPLICATION CHECKLIST (CONTINUED):

Applicants shall provide the following information when proposing off-site compensation for dunes and dune vegetation:

- N/A Name, address, phone number, and fax number, if applicable, of the owner of the property where the off-site compensation is proposed to be located;
- N/A Legal description of property proposed to be used for off-site compensation;
- N/A Source of the sand and dune vegetation to be used;
- N/A All information regarding permits and certificates issued for the restoration of the dunes and dune vegetation on the proposed compensation site;
- N/A All relevant information regarding the success, current status, and stabilization of the dune restoration efforts on the proposed compensation site;
- N/A Any increase in potential flood damage to the site where the adverse effects on dunes and dune vegetation will occur and to the public and private property adjacent to that site; and
- N/A Proposed dates of initiation and completion of the compensation.

NOTE: The following enclosures address all the items listed in the checklist above:

- Enclosure 1: Registered survey and metes and bounds description.
- Enclosure 2: Public and Environmental Facilities layout plan.
- Enclosure 3: Aerial photo dated December 8, 2000.
- Enclosure 4: U.S. Army Corps of Engineers 100% design documents for the North Padre Island Storm Damage Reduction and Environmental Restoration Project.

NORTH PADRE ISLAND STORM DAMAGE REDUCTION AND ENVIRONMENTAL
RESTORATION PROJECT

BEACHFRONT CONSTRUCTION CERTIFICATE
APPLICATION FORM
(additional sheet)

It is proposed to re-open Packery Channel by dredging from Texas State Highway 361 to about 1,500 feet beyond the shoreline and to dredge the existing channel from the SH361 bridge to the Gulf Intercoastal Waterway. Approximately one million cubic yards of dredged material will be placed along the beach and in the 3 other placement areas. Jetties 2,178 feet long will be constructed on both sides of the channel as shown on drawing C-2, Enclosure 4. Approximately 132,000 tons of stone of different sizes will be used to build the jetties, see drawings C-51 and C-52. Concrete bulkheads will be constructed on both sides of the channel beginning at the landward end of jetties and extending to the SH361, see drawing C-2, S-1 through S-7. Approximately 13,000 tons of rip rap type stone will be used for toe protection of the bulkheads. Sand will be placed behind the bulkheads as shown on drawing C-30 and C-31, to elevation +5.25 and extending to the existing flood protection wall on the south side of the channel and extending 130 feet on the north side of the channel where a steel sheet pile wall will be constructed to hold the sand in place. The sand will be graded. Recreation facilities will be constructed on the sand fill area on the north side of the channel. The facilities will include parking areas, bath houses and a maintenance building as shown on Enclosure 2.

Beach nourishment will be done on the south side of the channel as shown on drawings C-33 to C-44. The area of beach nourishment is about 7,500 feet by 220 feet. Approximately 530,000 cubic yards of sand will be placed along the beach.

All of the sand dredged from the channel will be placed in placement areas 1, 2, and 3 and along the beach. Cross section of the before and after conditions are shown on drawings C-40 through C-44.

The existing dune sand where the channel will be re-opened will be relocated in the same general area adjacent to the existing dune system, in the lower areas, and will be revegetated.

Description of any existing or proposed walkway or dune walkover on the tract:

Eight foot-wide concrete publicly accessible walkways will be provided adjacent to both the north and south bulkheads along the channel and on top of both of the jetties. These walkways will be constructed between the seagate and the end of the jetties on the south side of the channel (approximately 2,000 feet in length) and between the boat ramp and the end of the jetties on the north side (approximately 2,000 feet in length). These walkways will be ADA compliant. Dune walkovers are not anticipated to be constructed with this project.

February 13, 2002

TRACT 2

Enclosure 1

**STATE OF TEXAS
COUNTY OF NUECES**

**FIELDNOTES FOR A 182.675 ACRE TRACT OF STATE OWNED
LANDS BEING ALL OF THOSE CERTAIN TRACTS OF LAND
DESIGNATED AS TRACT 1 (138.876 ACRES), TRACT 4 (39.819 ACRES)
AND TRACT 5 (4.033 ACRES), DESCRIBED IN FINAL JUDGMENT OF
THE 28TH JUDICIAL DISTRICT COURT, CAUSE NO. 115,340-A, ALL
SITUATED IN NUECES COUNTY, TEXAS;**

Bearings and coordinates are surface, based on the Texas State Plane Coordinate System, South Zone (4205), North American Datum of 1983 and referenced to National Geodetic Survey Monuments, SP 020 and SQ 020. The mean higher high water shoreline, as cited herein was located on a contour elevation of 1.0 feet, North American Vertical Datum of 1988, utilizing datum derived from Tide Gauge Station "Bob Hall Pier".

BEGINNING, at a 1 inch iron rod, found 12 inches deep, on the east right-of-way line of that certain 400.00 foot wide road, known as State Highway No. 361, for the north corner of this tract, said point being the north corner of said Tract 1 and the west corner of that certain 145.09 acre tract of land, out of the north 280 acres of the William Bryan Survey No. 606, L.S. 64 and described in Document No. 956590, of the Official Public Records of Nueces County, Texas;

Thence, South 58° 20' 26" East, with the southwest boundary line of said 145.09 acre tract of land, and the most westerly northeast boundary of said Tract 1, at 316.05 varas (877.92 Feet), pass the north corner of aforementioned Tract 4, at 1,149.55 varas (3,193.19 feet), pass a 5/8 inch iron rod, set 18 inches deep, at the east corner of said Tract 4, in all a distance of 1,200.23 varas (3,333.97 feet), to a point (Coordinates – N 17,115,172.73 feet, E 1,404,712.35 feet), on the shoreline, of the Gulf of Mexico, for the east corner of this tract;

Thence, with the meanders of said shoreline, the following courses and distances:

South 22° 56' 55" West, a distance of 68.47 varas (190.19 feet);

South 23° 06' 09" West, a distance of 175.21 varas (486.70 feet);

South 25° 11' 43" West, a distance of 188.44 varas (523.45 feet);

South 19° 30' 21" West, a distance of 153.58 varas (426.62 feet);

South 29° 20' 13" West, a distance of 264.20 varas (733.90 feet) and

South 25° 59' 59" West, a distance of 187.05 varas (519.59 feet), to a point (Coordinates – N 17,112,567.36 feet, E 1,403,494.61 feet) at its intersection with the most easterly south boundary of aforementioned 138.876 acre Tract 1, for the south corner of this tract;

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Thence, North 65° 37' 26" West, with the most easterly southwest boundary line of said 138.876 acre Tract 1, said line also being the northeast boundary line of Lot 1A, Block 45, Padre Island Corpus Christi, Section A, a map of which is recorded in Volume 49, Pages 20 and 21, of the Map Records of Nueces County, Texas and also the most easterly northeast boundary line of that certain 342.732 acre tract of land, designated as Tract 2 and described in aforementioned Cause No. 115,340-A, at 32.40 varas (90.00 feet), pass a 5/8 inch iron rod, set 24 inches deep, for reference, in all a distance of 220.14 varas (611.51 feet), to a 5/8 inch iron rod, set, at an interior corner of said 342.732 acre Tract 2, for a corner of this tract;

Thence, North 24° 22' 34" East, with the most easterly northwest boundary line of said 138.876 acre Tract 1, and the most northerly southeast boundary line of said 342.732 acre Tract 2, a distance of 541.32 varas (1,503.66 feet), to a 5/8 inch iron rod, set, for a corner of this tract;

Thence, North 78° 15' 06" West, with the most westerly southwest boundary line of said 138.876 acre Tract 1, and the most westerly northeast boundary line of said 342.732 acre Tract 2, at 1,044.18 varas (2,900.51 feet) pass a 2 ½ inch iron pipe found, 24 inches deep, at its intersection with J. S. Boyles 1941 shoreline, for the northwest corner of said 342.732 acre Tract 2 and said point also being the south corner of that certain 4.033 acre tract of land, designated as Tract 5 and described in aforementioned Judgment 115,340-A and continuing, on same bearing, with the southwest boundary line of said Tract 5, in all a distance of 1,093.26 varas (3,036.82 feet), to a 5/8 inch iron rod, set, for a corner of this tract and the west corner of said Tract 5;

Thence, North 37° 25' 26" West, with the southwest boundary of said 4.033 acre Tract 5, a distance of 335.11 varas (930.86 feet) to a 5/8 inch iron rod, set, at its intersection with the southeast right-of-way line of 120.00 foot wide aforementioned State Highway No. 361, for the west corner of this tract, and the west corner of said 4.033 acre Tract 5 which point is on a circular curve to the left, whose radius point bears North 16° 48' 32" West a distance of 814.99 varas (2,263.87 feet);

Thence, in a northeasterly direction, along said southeast right-of-way line of State Highway No. 361, on said curve to the left, an arc distance of 62.05 varas (172.37 feet), to a 5/8 inch iron rod, set, for the most northerly corner of said 4.033 acre Tract 5, from which point the radius point of said curve bears North 21° 10' 21" West, a distance of 814.99 varas (2,263.87 feet) and the right-of-way for State Highway No. 361 widens from 43.20 varas (120.00 feet) to 144.00 varas (400.00 feet);

Thence, South 21° 10' 21" East, 50.40 varas (140.00 feet) to a 5/8 inch iron rod, set, on the beginning of a circular curve to the left and on the 144.00 vara (400.00 foot) southeast right-of-way line, for an interior corner of said 4.033 acre Tract 5 and this tract, from which point the radius point of said curve to the left, bears North 21° 10' 26" West, a distance of 865.39 varas (2,403.87 feet)

February 13, 2002

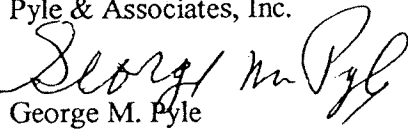
Thence, northerly along last mentioned curve to the left, along said 144.00 vara (400.00 foot) right-of-way line of State Highway No. 361, at an arc distance of 28.26 varas (78.49 feet), pass a 5/8 inch iron rod, set for a corner of said 4.033 acre Tract 5 and the most westerly corner of aforementioned 138.876 acre Tract 1 in all an arc distance of 174.12 varas (483.66 feet), to the point of tangent, for a corner of this tract;

Thence, North 57° 17' 53" East, continuing with above described common boundary line of said 138.876 acre Tract 1 and southeast right-of-way line of State Highway No. 361, a distance of 143.70 varas (399.16 feet), to a 5/8 inch iron rod set, at the point of curvature of a circular curve to the left, which curve has a central angle of 26° 57' 19", a radius of 802.95 varas (2,230.42 feet), a tangent distance of 192.44 varas (534.56 feet) and an arc length of 377.76 varas (1,049.32 feet);

Thence, with said curve to the left, continuing with said common boundary line of 138.876 acre Tract 1 and southeast 400.00 foot right-of-way line of State Highway No. 361, in a northeasterly direction, an arc distance of 377.76 varas (1,049.32 feet), to a 2 inch iron pipe found, at the point of tangent;

Thence, North 30° 20' 34" East, continuing with above described common boundary line of said 138.876 acre Tract 1 and southeast right-of-way line of State Highway No. 361, a distance of 110.80 varas (307.78 feet), to the **PLACE OF BEGINNING** and containing 182.675 acres of land.

Pyle & Associates, Inc.



George M. Pyle

R.P.L.S. No. 1258, L.S.L.S.

February 13, 2002

TRACT 3

**STATE OF TEXAS
COUNTY OF NUECES**

**FIELDNOTES FOR A 58.664 ACRE TRACT OF LAND OUT OF STATE OWNED
SUBMERGED LANDS OUT OF GULF OF MEXICO STATE TRACT 908 AND ALL
THAT CERTAIN 17.946 ACRE TRACT OF LAND DESIGNATED AS TRACT NO. 3
AND DESCRIBED IN FINAL JUDGMENT OF THE 28TH JUDICIAL
DISTRICT COURT, CAUSE NO. 115,340-A, NUECES COUNTY, TEXAS;**

Bearings and coordinates are surface, based on the Texas State Plane Coordinate System, South Zone (4205), North American Datum of 1983 and referenced to National Geodetic Survey Monuments, SP 020 and SQ 020. The mean higher high water shoreline, as cited herein was located on a contour elevation of 1.0 feet, North American Vertical Datum of 1988, utilizing datum derived from Tide Gauge Station "Bob Hall Pier".

BEGINNING, at a point (Coordinates – N 17,115,172.73 feet, E 1,404,712.35 feet) on the shoreline of said Gulf of Mexico, at its intersection with the extended south boundary line of that certain 145.09 acre tract of land, out of the north 280 acres of the William Bryan Survey No. 606, L.S. 64 and described in Document No. 956590, of the Official Public Records of Nueces County, Texas, for the north corner of this tract, from which point a 1 inch iron rod, found for the west corner of said 145.09 acre tract of land, on the east right-of-way line of that certain 400.00 foot wide road, known as State Highway No. 361, bears North 58° 20' 26" West, with said south boundary line of the 145.09 acre tract of land, at 50.63 varas (140.76 feet), pass a 5/8 inch iron rod set, 24 inches deep, for reference, at its intersection with the original east boundary line of said William Bryan Survey, in all a distance of 1200.23 varas (3,333.97 feet);

Thence, South 65° 24' 27" East, a distance of 725.37 varas (2,014.91 feet), to a point for the east corner of this tract;

Thence, South 24° 35' 02" West, a distance of 414.96 varas (1,152.68 feet), to a point, for the south corner of this tract;

Thence, North 72° 27' 56" West, a distance of 719.99 varas (1,999.97 feet), to a point (Coordinates – N 17,113,888.56 feet, E 1,404,157.90 feet) on aforementioned shoreline, for the west corner of this tract;

Thence, with the meanders of said shoreline, the following courses and distances:

North 19° 30' 21" East, a distance of 71.69 varas (199.15 feet);

North 25° 11' 43" East, a distance of 188.44 varas (523.45 feet);

North 23° 06' 09" East, a distance of 175.21 varas (486.70 feet);

North 22° 56' 48" East, a distance of 68.47 varas (190.19 feet), to the **PLACE OF BEGINNING** and containing 58.664 acres of land.

Pyle & Associates, Inc.


George M. Pyle

R.P.L.S. No. 1258, L.S.L.S.

February 13, 2002

TRACT 4

**STATE OF TEXAS
COUNTY OF NUECES**

**FIELDNOTES FOR A 219.640 ACRE TRACT OF LAND OUT OF STATE
OWNED SUBMERGED LANDS, OF GULF OF MEXICO STATE TRACT
NO. 908 AND ALL OF THAT CERTAIN 17.946 ACRE TRACT OF LAND
DESIGNATED AS TRACT NO. 3 AND DESCRIBED IN FINAL
JUDGMENT OF THE 28TH JUDICIAL DISTRICT COURT, CAUSE NO.
115,340-A, NUECES COUNTY, TEXAS;**

Bearings and coordinates are surface, based on the Texas State Plane Coordinate System, South Zone (4205), North American Datum of 1983 and referenced to National Geodetic Survey Monuments, SP 020 and SQ 020. The mean higher high water shoreline, as cited herein was located on a contour elevation of 1.0 feet, North American Vertical Datum of 1988, utilizing datum derived from Tide Gauge Station "Bob Hall Pier".

BEGINNING, at a point (Coordinates – N 17,113,888.56 feet, E 1,404,157.90 feet) on the shoreline of said Gulf of Mexico, for the north corner of this tract, from which point a 5/8 inch iron rod set, for the northeast corner of that certain 342.732 acre Tract 2, described in Cause No. 115,340-A, in the Judgment of the 28th Judicial District Court, bears North 63° 21' 42" West, a distance of 241.52 varas (670.90 feet);

Thence, South 72° 27' 56" East, a distance of 391.72 varas (1,088.10 feet), to a point, for the east corner of this tract;

Thence, South 24° 52' 45" West, a distance of 2,855.17 varas (7,931.02 feet), to a point, for the south corner of this tract;

Thence, North 65° 07' 15" West, a distance of 406.68 varas (1,129.66 feet), to a point (Coordinates – N 17,106,840.99 feet, E 1,400,834.00 feet), on aforementioned shoreline, for the west corner of this tract;

Thence, North 24° 04' 43" East, with said shoreline, a distance of 256.24 varas (711.79 feet), to a point;

Thence, North 24° 28' 11" East, continuing with said shoreline, a distance of 56.20 varas (156.12 feet), to a point, on the southwest boundary line of that certain 17.946 acre tract of land, designated as Tract 3 and described in final Judgment of 28th Judicial District Court, Cause No. 115, 340-A, for a corner of this tract;

February 13, 2002

Thence, North 89° 14' 26" West, with said southwest boundary line of 17.946 acre Tract 3, at 75.79 varas (210.52 feet) pass a 5/8 inch iron rod, set on the existing upland vegetation line, in all a distance of 215.35 varas (598.19 feet), to a point, for a corner of this tract, said point also being the west corner of said 17.946 Tract 3;

Thence, North 24° 22' 34" East, with the northwest boundary line of said 17.946 acre Tract 3, a distance of 492.90 varas (1,369.16 feet), to a point, for a corner of this tract, said point also being the north corner of said 17.946 acre Tract 3;

Thence, South 65° 46' 26" East, with the northeast boundary line of said Tract 3, at 144.96 varas (402.67 feet), pass a 5/8 inch iron rod set at aforementioned existing upland vegetation line, in all a distance of 199.54 varas (554.29 feet), to a point, on aforementioned shoreline, for an inside corner of this tract;

Thence, with the meanders of said shoreline, the following courses and distances:

North 25° 10' 56" East, a distance of 395.58 varas (1,098.84 feet);

North 24° 59' 50" East, a distance of 310.79 varas (863.31 feet);

North 24° 42' 27" East, a distance of 398.34 varas (1,106.51 feet);

North 26° 56' 02" East, a distance of 102.02 varas (283.40 feet);

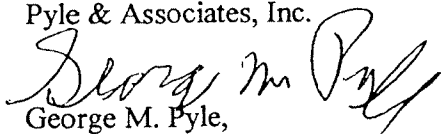
North 24° 31' 18" East, a distance of 194.26 varas (539.61 feet);

North 25° 59' 59" East, a distance of 339.73 varas (943.68 feet);

North 29° 20' 13" East, a distance of 264.20 varas (733.90 feet);

North 19° 30' 21" East, a distance of 81.89 varas (227.47 feet), to the **PLACE OF BEGINNING** and containing 219.640 acres of land.

Pyle & Associates, Inc.



George M. Pyle,

R.P.L.S. No. 1258, L.S.L.S.

February 13, 2002

TRACT 5

**STATE OF TEXAS
COUNTY OF NUECES**

**FIELDNOTES FOR A 108.250 ACRE TRACT OF STATE OWNED
SUBMERGED LANDS, OUT OF GULF OF MEXICO STATE TRACTS
907 AND 908, NUECES COUNTY, TEXAS;**

Bearings and coordinates are surface, based on the Texas State Plane Coordinate System, South Zone (4205), North American Datum of 1983 and referenced to National Geodetic Survey Monuments, SP 020 and SQ 020. The mean higher high water shoreline, as cited herein was located on a contour elevation of 1.0 feet, North American Vertical Datum of 1988, utilizing datum derived from Tide Gauge Station "Bob Hall Pier".

BEGINNING, at a point (Coordinates – N 17,115,172.73 feet, E 1,404,712.35 feet) on the shoreline of said Gulf of Mexico, at its intersection with the extended south boundary line of that certain 145.09 acre tract of land, out of the north 280 acres of the William Bryan Survey No. 606, L.S. 64 and described in Document No. 956590, of the Official Public Records of Nueces County, Texas, for the west corner of this tract, from which point a 1 inch iron rod, found for the west corner of said 145.09 acre tract of land, on the east right-of-way line of that certain 400.00 foot wide road, known as State Highway No. 361, bears North 58° 20' 26" West, with said extension of the south boundary line of the 145.09 acre tract of land, at 11.22 varas (31.18 feet), pass the south corner of said 145.09 acre tract of land, at 50.63 varas (140.76 feet), pass a 5/8 inch iron rod set, 24 inches deep, for reference, at its intersection with the original east boundary line of said William Bryan Survey, in all a distance of 1200.23 varas (3,333.97 feet);

Thence, with the meanders of said shoreline, the following courses and distances:

North 22° 56' 55" East, a distance of 111.41 varas (309.47 feet);

North 23° 49' 56" East, a distance of 300.71 varas (835.31 feet);

North 25° 23' 28" East, a distance of 270.92 varas (752.57 feet);

North 24° 22' 23" East, a distance of 209.03 varas (580.64 feet);

North 25° 13' 18" East, a distance of 283.81 varas (788.37 feet) and

North 24° 54' 51" East, a distance of 319.92 varas (888.67 feet) to a point,

(Coordinates – N 17,118,949.74 feet, E 1,406,443.14 feet) for the north corner of this tract, from which point a 5/8 inch iron rod, set bears North 65° 07' 15" West, a distance of 54.00 varas (150.00 feet);

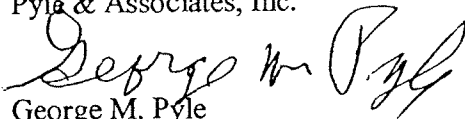
Thence, South 65° 07' 15" East, a distance of 408.70 varas (1,135.27 feet), to a point, for the east corner of this tract;

February 13, 2002

Thence, South 24° 52' 45" West, a distance of 1,493.66 varas (4,149.06 feet, to a point, for the south corner of this tract;

Thence, North 65° 24' 27" West, a distance of 401.92 varas (1,116.45 feet), to the **PLACE OF BEGINNING** and containing 108.250 acres of land.

Pyle & Associates, Inc.

A handwritten signature in dark ink, appearing to read "George M. Pyle", is written over the printed name.

George M. Pyle

R.P.L.S. No. 1258, L.S.L.S.

**NORTH PADRE ISLAND STORM DAMAGE
REDUCTION AND ENVIRONMENTAL
RESTORATION PROJECT
(PACKERY CHANNEL)**

DUNE PROTECTION PERMIT APPLICATION

MARCH 18, 2002

**CITY OF CORPUS CHRISTI
P. O. BOX 9277
CORPUS CHRISTI, TX 78469-9277**




City of
Corpus
Christi

March 18, 2002

RECEIVED

MAR 18 2002

RECEIVED
COUNTY CLERK'S OFFICE
CORPUS CHRISTI, TEXAS
By: 

Honorable Richard M. Borchard
County Judge
Nueces County Courthouse
901 Leopard Street
Corpus Christi, TX 78401

Subject: Dune Protection Permit – Packery Channel

Dear Judge Borchard:

First, I would like to extend my appreciation for your letter of February 21, 2002 offering to "... assist in any way to expedite the City of Corpus Christi's application for dune protection permit relating to Packery Channel." Submitted under copy of this letter is that dune protection permit. The City is acting as the applicant for a number of groups including Nueces County, Del Mar Junior College District, and the City of Corpus Christi, as part of the Corpus Christi Reinvestment Zone No. 2, the U. S. Corps of Engineers, which is slated to undertake the project as a congressional mandate, and the State of Texas General Land Office, which is proposing to fund a portion of the construction.

Also, today, we have submitted the beachfront construction permit application to the City of Corpus Christi's Planning Department and that permit application is scheduled to be considered by the Planning Commission on April 10, 2002.

Any assistance which your office can provide in expediting the review of the application will be appreciated. Should any additional information be needed during your consideration, please do not hesitate to call upon me or Mr. Ángel Escobar, City Engineer, at 880-3507.

Sincerely,



David R. Garcia
City Manager

cc: Mayor and City Council
Ángel Escobar, City Engineer
Mic Raasch, Planning Department

City of Corpus Christi

City of Corpus Christi • Corpus Christi, Texas 78401 • Tel: 880-1000 • Fax: 880-1001

**NORTH PADRE ISLAND STORM DAMAGE REDUCTION AND
ENVIRONMENTAL RESTORATION PROJECT
(PACKERY CHANNEL)**

DUNE PROTECTION PERMIT APPLICATION

INDEX OF ATTACHMENTS

A	Dune Protection Permit Application
A-1	Lease of State Lands
A-2	Metes and Bounds Description and Boundary Survey of Lease
A-6	Proposed Public and Environmental Facilities within Dune Protection Area
A-9	Proposed Public and Environmental Facilities Plan East of State Highway 361
A-10	Aerial Photograph (INCLUDED IN ORIGINAL APPLICATION ONLY)
A-13A	Boundary Survey of Project East of State Highway 361 including Offshore Tracts
A-13B	Dune Mitigation Plan Map
A-13C	Dune Mitigation Plan
A-15	Beachfront Construction Certificate Application
C2	Contour Map
C3	Excerpts of May 2001 Shoreline Erosion Study (Bureau of Economic Geology)
C-4	Project Elevation Certificate

Attachment A

North Padre Island Storm Damage Reduction and Environmental Restoration Project

Dune Protection Permit

CONSTRUCTION

The following information has been provided in response to the requirements outlined in the "Nueces County Beach Management Plan" adopted by the Nueces County Commissioners Court August 23, 1995. Mapping may depict areas outside of the permit area, but all calculations and information requested under this section shall be based on the area between the dune protection line and mean high tide, unless otherwise noted.

A. Large and Small-Scale Construction

For all proposed construction (large and small-scale), applicants shall submit the following items and information:

- (1) *the name, address, phone number, and if applicable, fax number of the applicant, and the name of the property owner, if different from the applicant;*

The City of Corpus Christi is acting as the Applicant for the project which is being funded by a combination of sources, including the Federal Government through the U. S. Corps of Engineers, the State of Texas General Land Office, the City of Corpus Christi, Nueces County, and Del Mar Junior College District, the latter three from the Corpus Christi Reinvestment Zone No. 2.

The land is owned by the State, but is under lease to the City of Corpus Christi:

City of Corpus Christi
David R. Garcia, City Manager
P. O. Box 9277
Corpus Christi, TX 78469-9277

Telephone: 361/880-3220
Fax: 361/880-3839

General Land Office
Bill Grimes, Director
Resource Conservation
P. O. Box 12873
Austin, TX 78711-2873
512/475-1464
512/463-5233

See Attachment A-1.

- (2) *a complete legal description of the tract and a statement of its size in acres or square feet;*

The site contains 182.657 acres. See attachment A-2.

- (3) *the number of proposed structures and whether the structures are amenities or habitable structures;*

All of the structures are flatwork, including bulkheads, parking areas, jetties, and roadways. There are no habitable structures.

See attachment A-6.

- (4) *the number of parking spaces:*

Parking spaces are broken down as follows:

Seawall - 300
Lot south of jetties - minimum 140
Lot north of jetties - minimum 47
Lot landward west of proposed bathhouse - 320
Boat ramp lot - 138

- (5) *the approximate percentage of existing and finished open spaces (those areas completely free of structures);*

Total area within 1000' dune permit area = 59.10 acres 100%
Land areas undeveloped after construction = 43.17 acres 73%
Land area undeveloped + finished Channel = 48.14 acres 81%

- (6) *the floor plan and elevation view of the structure proposed to be constructed or expanded;*

See attached A-6.

- (7) *the approximate length of the construction process;*

The current schedule shows construction beginning October 2002 and being completed in December 2004.

- (8) *a description (including location) of any existing or proposed walkways or dune walkovers on the tract;*

See Attachment #9 Public & Environmental Facilities Plans. Eight foot-wide concrete publicly accessible walkways will be provided adjacent to both the north and south bulkheads along the channel and on top of both of the jetties. These walkways will be constructed between the seagate and the end of the jetties on the south side of the channel (approximately 2,000 feet in length) and between the boat ramp and the end of the jetties on the north side (approximately 2,000 feet in length). These walkways will be ADA-compliant. Dune walkovers are not anticipated to be constructed with this project.

- (9) *a grading and layout plan identifying all elevations (in reference to the National oceanic and Atmospheric Administration datum), existing contours of the project area (including the location of dunes and swales), and proposed contours for the final grade;*

See Attachments A-9, A-13A and A-13B.

- (10) *photographs of the site which clearly show the current location of the line of vegetation and the existing dunes on the tract;*

See Attachment A-10.

- (11) *the effects of the proposed activity on the beach/dune system which cannot be avoided should the proposed activity be permitted;*

Attachment A-13B shows the location of construction which will have an adverse effect on critical dunes and/or dune vegetation. Approximately 5,670 cubic yards of dunes will be displaced.

- (12) *if required, a comprehensive mitigation plan which includes a detailed description of the methods which will be used to avoid, minimize, mitigate and/or compensate for any adverse effects on dunes or dune vegetation. Additional details of mitigation planning may be found in section III.B. on page 17 of this order.*

The dunes, which will be displaced, contain 5,670 cubic yards. The 5,670 cubic yards of displaced dunes will be mitigated on a one for one basis directly to the north of the north bulkhead and in connection with the existing dunes at that location. The site of the new dunes is a depression in the existing foredune ridge, and will significantly enhance the ridge to provide better storm protection. A comprehensive mitigation plan is included in Attachment A-13C.

- (13) *an accurate map or plat of the site identifying;*

- (a) *the site by its legal description, including, where applicable, the subdivision, block and lot;*

See attachments A-2, A-13A, and A-13B.

- (b) *the location of the property lines and a notation of the legal description of adjoining tracts;*

See attachments A-2, A-13A, and A-13B.

(c) the location of the structures, the footprint or perimeter of the proposed construction on the tract;

See attachment A-13B.

(d) proposed roadways and driveways and proposed landscaping activities on the tract;

See attachment A-13B.

(e) the location of any seawalls or any other erosion response structures on the tract and on the properties immediately adjacent to the tract; and

See Attachment A-9, A-13A, and A-13B.

(f) if known, the location and extent of any pre-existing human modifications on the tract.

See Attachment A-13.

(14) a preliminary determination by the applicant as to whether the proposed construction complies with all aspects of the County's dune protection plan;

The applicant is of the opinion that the proposed construction complies with the Nueces County beach management plan.

(15) a preliminary determination by the applicant as to how the proposed beachfront construction complies with the local government's dune protection plan and the beach access plan provisions adopted by the local government with such authority relating to public beach ingress/egress, off-beach parking, and avoidance of reduction in the size of the public beach due to erosion including, but not limited to: evidence of the applicants co-application to the local government and beachfront construction certification responsibility, as defined in Section 61 of the Texas Natural Resources Code, for the proposed project.

It is the opinion of the applicant that the application complies with Section 61 of the Texas Natural Resources Code. The project includes the substantial enlarging of beach areas, the provision of tremendous recreational facilities, and is overwhelmingly supported by not only the local public which voted for the project, but also the Congress of the United States has made it a Federal project, and the State of Texas which is proposing to contribute to the project. The applicant has applied today, March 18, 2002. under the Corpus Christi Coastal Management Plan for a beachfront construction certificate. See Attachment 15.

(16) the permit fees required by section II.J, page 12 of this order;

See enclosed A-16.

B. Large-Scale Construction

For all proposed large-scale construction, applicants shall submit the following additional items and information.

(1) if the tract is located in a subdivision and the applicant is the owner or developer of the subdivision, a certified copy of the recorded plat of the subdivision, or, if not a recorded subdivision, a copy of the preliminary plat of the subdivision as filed with the local government having jurisdiction over subdivision development of the site, such preliminary plat having been certified by a licenses surveyor, and a statement of the total area of the subdivision in acres or square feet;

The tract is not located in a subdivision, and there are no plans to subdivide the property.

(2) in the case of multiple-unit dwellings, the number of units proposed;

There are no residential units on the property or planned to be on the property.

(3) alternatives to the proposed location of construction on the tract or to the proposed methods of construction which would cause fewer or no adverse effects on dunes and dune vegetation;

Over the years, a large number of studies have been done on the project under the auspices of the City of Corpus Christi, Nueces County, Corpus Christi Chamber of Commerce, Texas General Land Office, and now the Corps of Engineers. There appears to be no alternative location for this project.

(4) the proposed activities impact on the natural drainage pattern of the site and the adjacent lots;

The project has been designed to conform to existing topography generally, and there will be no significant impacts to the drainage pattern on adjacent lots.

C. For all proposed construction (large and small scale), if applicants already have the following items and information, local governments shall require the following items and information to be submitted in addition to the other information required:

(1) a copy of a blueprint of the proposed construction, such print to indicate detailed floor plans and structural layout of the proposed project;

See Attachment A-6.

(2) a copy of a topographical survey of the site;

See Attachment C-2.

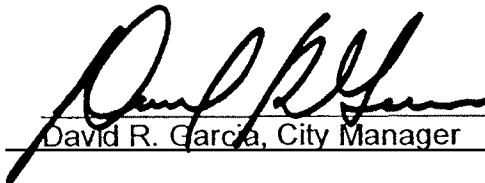
(3) the most recent local historical erosion rate data (as determined by the University of Texas at Austin, Bureau of Economic Geology) and the activity's potential impact on coastal erosion;

See Attachment C-3.

(4) a copy of the FEMA "Elevation Certificate."

See Attachment C-4.

I certify that the information provided herewith is accurate and correct to the best of my knowledge.



David R. Garcia, City Manager

March 18, 2002

**Texas General
Land Office**



**David Dewhurst
Commissioner**

March 13, 2002

Mr. W. Thomas Utter
Assistant City Manager
City of Corpus Christi
P.O. Box 9277
Corpus Christi, Texas 78469-9277

Re: Assignment of Coastal Lease No. CL 980012

Dear Mr. Utter:

Attached is a fully executed original of the referenced coastal lease assignment. If you have any questions, please call me at (512) 463-5251.

Sincerely,

Jim Crow
Lease Manager

Encl: 1

Mailing

Post Office Box 12873
Austin, Texas
78711-2873

Street

Stephen F. Austin Building
700 North Congress Avenue
Austin, Texas 78701-1495

12.463.5001
1.800.998.4GLO
www.glo.state.tx.us

Attachment A-1

The State of Texas



Austin, Texas

ASSIGNMENT AND ASSUMPTION AGREEMENT OF COASTAL LEASE NO. CL980012

STATE OF TEXAS §

KNOW ALL BY THESE PRESENTS:

COUNTY OF NUECES §

WHEREAS, by Coastal Lease No. CL980012, effective 01/01/1998, (the "Lease"), the School Land Board, acting by and through the Land Commissioner, on behalf of the Permanent School Fund (the "State"), granted to Nueces County, Texas, herein called ("Assignor"), the right to use certain real property located in Nueces County, Texas, (the "Premises") and more particularly described on Exhibits to such Lease, for a term commencing on 01/01/1998, and terminating 12/29/2002, reference being here made to the Lease for all purposes; and

WHEREAS, Assignor desires to assign its interest as "Lessee" under the aforesaid Lease to the City of Corpus Christi, Texas, hereinafter referred to as "Assignee", and Assignee agrees to such assignment and shall assume the duties of Lessee under the Lease;

NOW, THEREFORE, in consideration of the premises and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. Assignor hereby sells, assigns and transfers unto Assignee, to have and to hold, Assignor's interest under the Lease for the remainder of the Lease term (the "Assignment Period"), effective February 1, 2002 (the "Effective Date").
2. Assignee hereby accepts this Assignment and assumes and agrees to perform the covenants, duties and obligations of "Lessee" pursuant to the Lease; and Assignee shall be fully and directly liable for the performance of such covenants, duties and obligations.
3. ASSIGNEE HAS INSPECTED THE PHYSICAL AND TOPOGRAPHIC CONDITION OF THE PREMISES (INCLUDING THE IMPROVEMENTS LOCATED THEREON, IF ANY) AND ACCEPTS SAME "AS IS" IN ITS EXISTING PHYSICAL AND TOPOGRAPHIC CONDITION. AS A MATERIAL PART OF THE CONSIDERATION FOR THIS LEASE, ASSIGNEE AND THE STATE AGREE THAT ASSIGNEE IS TAKING THE PREMISES "AS IS" WITH ANY AND ALL LATENT AND PATENT DEFECTS AND THAT THERE IS NO WARRANTY BY THE STATE THAT THE PREMISES ARE FIT FOR A PARTICULAR PURPOSE. ASSIGNEE ACKNOWLEDGES THAT IT IS NOT RELYING UPON ANY REPRESENTATION, STATEMENT OR OTHER ASSERTION BY THE STATE WITH RESPECT TO THE PREMISES' CONDITION, BUT IS RELYING UPON ITS EXAMINATION OF THE PREMISES. ASSIGNEE TAKES THE PREMISES WITH THE EXPRESS UNDERSTANDING THAT THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, AND THE STATE DISCLAIMS ANY AND ALL WARRANTIES OF HABITABILITY, MERCHANTABILITY, SUITABILITY, FITNESS FOR ANY PURPOSE, AND ANY OTHER WARRANTY WHATSOEVER NOT EXPRESSLY SET FORTH IN THIS LEASE. THE STATE AND ASSIGNEE HEREBY AGREE AND ACKNOWLEDGE THAT THE USE OF THE TERMS "GRANT" AND/OR "CONVEY" IN NO WAY IMPLIES THAT THIS LEASE IS FREE OF LIENS, ENCUMBRANCES AND/OR PRIOR RIGHTS. ASSIGNEE IS HEREBY PUT ON NOTICE THAT ANY PRIOR

GRANT AND/OR ENCUMBRANCE MAY BE OF RECORD AND ASSIGNEE IS ADVISED TO EXAMINE THE RECORDS IN THE ARCHIVES AND RECORDS DIVISION OF THE TEXAS GENERAL LAND OFFICE, 1700 NORTH CONGRESS AVENUE, AUSTIN, TEXAS 78701, AND ALL OTHER LAND TITLE RECORDS OF THE COUNTY IN WHICH THE PREMISES ARE LOCATED.

4. Assignor hereby releases and relinquishes any and all claims to any sum paid the State with respect to the Premises, whether as rent, future rent, or other consideration. Assignor acknowledges and agrees that the State has fully performed all of its covenants, duties and obligations accruing under the Lease and does hereby release the State from any and all claims for non-performance.
5. Assignor will, promptly upon execution of this instrument, pay to the State the sum of Fifty and no/Dollars (\$50.00) as an Assignment Fee if not submitted previously.
6. Any notice to be given under the terms of the Lease or this Assignment shall be in writing and shall either be delivered by hand or sent by U. S. Registered or Certified Mail, adequate postage prepaid, if for the State, to it at the Notice Address stated in the Lease; if for Assignee, to it at P.O. Box 9277, Corpus Christi, Texas 78469-9277. Either party's address may be changed from time to time by such party by giving notice as provided above, except that the Premises may not be used by Assignee as the notice address. No change of address of either party shall be binding on the other party until notice of such change of address is given as herein provided. A post office receipt for registration of such notice or signed return receipt shall be conclusive that such notice was delivered in due course of mail if mailed as provided above.
7. Assignor, Assignee and the State hereby acknowledge that the current annual rental/consideration is Zero And 00/100 Dollars (\$ 0.00).
8. Except as otherwise specifically provided herein, all of the terms and provisions of the Lease shall remain in full force and effect during the Assignment Period. All defined terms used herein shall have the same meaning as when sed in the Lease unless otherwise indicated herein.
9. In the event of a conflict between any provision of this Agreement and any administrative rule promulgated by the Texas General Land Office and/or the School Land Board, this Agreement shall control.

EXECUTED in multiple counterparts, each of which shall have the effect of an original.

Assignor: Nueces County, Texas

Richard M. Borchard
Signature of Current Lease Holder

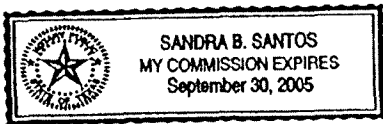
Richard M. Borchard
Nueces County Judge

2/27/02
Printed Name & Title
Date of Signature

Acknowledgment of Assignor's Signature

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me, the undersigned authority, on the 27
day of February, 2002, by Richard M. Borchard.



Sandra B. Santos
Notary Public

My commission expires: 9/30/05

Assignee: City of Corpus Christi, Texas

David R. Garcia
Signature of Individual Assuming Responsibility for the Lease

CITY MANAGER DAVID R. GARCIA
Printed Name & Title

02/27/02
Date of Signature

Acknowledgment of Assignee's Signature

STATE OF TEXAS §
 §
COUNTY OF Nueces §

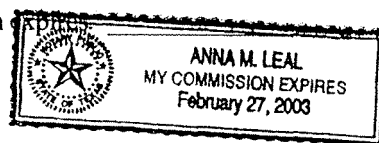
This instrument was acknowledged before me, the undersigned authority, on the 27
day of February, 2002, by David R. Garcia.

Approved as to form:
James R. Bray, Jr.
City Attorney

Anna Leal
Notary Public

By: *R. Jay Reining*
R. Jay Reining
Assistant City Attorney

My commission expires:



THE UNDERSIGNED, as Grantor in the above-described Lease (CL980012), subject to the conditions stated in Paragraph 4 above, does hereby consent to the assignment of the said instrument as specified above.

IN TESTIMONY WHEREOF, witness my hand and the Seal of Office.

THE STATE OF TEXAS

By: David Dewhurst
David Dewhurst,
Commissioner, Texas General Land Office
Chairman, School Land Board

Date: 3-12-2002

APPROVED:

Contents:

Se

Legal:

Se

Deputy:

NT

Executive:

CS

TRACT 2

STATE OF TEXAS
COUNTY OF NUECES

FIELDNOTES FOR A 182.675 ACRE TRACT OF STATE OWNED LANDS BEING ALL OF THOSE CERTAIN TRACTS OF LAND DESIGNATED AS TRACT 1 (138.876 ACRES), TRACT 4 (39.819 ACRES) AND TRACT 5 (4.033 ACRES), DESCRIBED IN FINAL JUDGMENT OF THE 28TH JUDICIAL DISTRICT COURT, CAUSE NO. 115,340-A, ALL SITUATED IN NUECES COUNTY, TEXAS;

Bearings and coordinates are surface, based on the Texas State Plane Coordinate System, South Zone (4205), North American Datum of 1983 and referenced to National Geodetic Survey Monuments, SP 020 and SQ 020. The mean higher high water shoreline, as cited herein was located on a contour elevation of 1.0 feet, North American Vertical Datum of 1988, utilizing datum derived from Tide Gauge Station "Bob Hall Pier".

BEGINNING, at a 1 inch iron rod, found 12 inches deep, on the east right-of-way line of that certain 400.00 foot wide road, known as State Highway No. 361, for the north corner of this tract, said point being the north corner of said Tract 1 and the west corner of that certain 145.09 acre tract of land, out of the north 280 acres of the William Bryan Survey No. 606, L.S. 64 and described in Document No. 956590, of the Official Public Records of Nueces County, Texas;

Thence, South 58° 20' 26" East, with the southwest boundary line of said 145.09 acre tract of land, and the most westerly northeast boundary of said Tract 1, at 316.05 varas (877.92 Feet), pass the north corner of aforementioned Tract 4, at 1,149.55 varas (3,193.19 feet), pass a 5/8 inch iron rod, set 18 inches deep, at the east corner of said Tract 4, in all a distance of 1,200.23 varas (3,333.97 feet), to a point (Coordinates – N 17,115,172.73 feet, E 1,404,712.35 feet), on the shoreline, of the Gulf of Mexico, for the east corner of this tract;

Thence, with the meanders of said shoreline, the following courses and distances:

South 22° 56' 55" West, a distance of 68.47 varas (190.19 feet);

South 23° 06' 09" West, a distance of 175.21 varas (486.70 feet);

South 25° 11' 43" West, a distance of 188.44 varas (523.45 feet);

South 19° 30' 21" West, a distance of 153.58 varas (426.62 feet);

South 29° 20' 13" West, a distance of 264.20 varas (733.90 feet) and

South 25° 59' 59" West, a distance of 187.05 varas (519.59 feet), to a point (Coordinates – N 17,112,567.36 feet, E 1,403,494.61 feet) at its intersection with the most easterly south boundary of aforementioned 138.876 acre Tract 1, for the south corner of this tract;

Thence. North 65° 37' 26" West, with the most easterly southwest boundary line of said 138.876 acre Tract 1, said line also being the northeast boundary line of Lot 1A, Block 45, Padre Island Corpus Christi, Section A, a map of which is recorded in Volume 49, Pages 20 and 21, of the Map Records of Nueces County, Texas and also the most easterly northeast boundary line of that certain 342.732 acre tract of land, designated as Tract 2 and described in aforementioned Cause No. 115,340-A, at 32.40 varas (90.00 feet), pass a 5/8 inch iron rod, set 24 inches deep, for reference, in all a distance of 220.14 varas (611.51 feet), to a 5/8 inch iron rod, set, at an interior corner of said 342.732 acre Tract 2, for a corner of this tract;

Thence, North 24° 22' 34" East, with the most easterly northwest boundary line of said 138.876 acre Tract 1, and the most northerly southeast boundary line of said 342.732 acre Tract 2, a distance of 541.32 varas (1,503.66 feet), to a 5/8 inch iron rod, set, for a corner of this tract;

Thence. North 78° 15' 06" West, with the most westerly southwest boundary line of said 138.876 acre Tract 1, and the most westerly northeast boundary line of said 342.732 acre Tract 2, at 1,044.18 varas (2,900.51 feet) pass a 2 1/2 inch iron pipe found, 24 inches deep, at its intersection with J. S. Boyles 1941 shoreline, for the northwest corner of said 342.732 acre Tract 2 and said point also being the south corner of that certain 4.033 acre tract of land, designated as Tract 5 and described in aforementioned Judgment 115,340-A and continuing, on same bearing, with the southwest boundary line of said Tract 5, in all a distance of 1,093.26 varas (3,036.82 feet), to a 5/8 inch iron rod, set, for a corner of this tract and the west corner of said Tract 5;

Thence, North 37° 25' 26" West, with the southwest boundary of said 4.033 acre Tract 5, a distance of 335.11 varas (930.86 feet) to a 5/8 inch iron rod, set, at its intersection with the southeast right-of-way line of 120.00 foot wide aforementioned State Highway No. 361, for the west corner of this tract, and the west corner of said 4.033 acre Tract 5 which point is on a circular curve to the left, whose radius point bears North 16° 48' 32" West a distance of 814.99 varas (2,263.87 feet);

Thence, in a northeasterly direction, along said southeast right-of-way line of State Highway No. 361, on said curve to the left, an arc distance of 62.05 varas (172.37 feet), to a 5/8 inch iron rod, set, for the most northerly corner of said 4.033 acre Tract 5, from which point the radius point of said curve bears North 21° 10' 21" West, a distance of 814.99 varas (2,263.87 feet) and the right-of-way for State Highway No. 361 widens from 43.20 varas (120.00 feet) to 144.00 varas (400.00 feet);

Thence, South 21° 10' 21" East, 50.40 varas (140.00 feet) to a 5/8 inch iron rod, set, on the beginning of a circular curve to the left and on the 144.00 vara (400.00 foot) southeast right-of-way line, for an interior corner of said 4.033 acre Tract 5 and this tract, from which point the radius point of said curve to the left, bears North 21° 10' 26" West, a distance of 865.39 varas (2,403.87 feet)

February 13, 2002

Thence. northerly along last mentioned curve to the left, along said 144.00 vara (400.00 foot) right-of-way line of State Highway No. 361, at an arc distance of 28.26 varas (78.49 feet), pass a 5/8 inch iron rod, set for a corner of said 4.033 acre Tract 5 and the most westerly corner of aforementioned 138.876 acre Tract 1 in all an arc distance of 174.12 varas (483.66 feet), to the point of tangent, for a corner of this tract:

Thence, North 57° 17' 53" East, continuing with above described common boundary line of said 138.876 acre Tract 1 and southeast right-of-way line of State Highway No. 361, a distance of 143.70 varas (399.16 feet), to a 5/8 inch iron rod set, at the point of curvature of a circular curve to the left, which curve has a central angle of 26° 57' 19", a radius of 802.95 varas (2,230.42 feet), a tangent distance of 192.44 varas (534.56 feet) and an arc length of 377.76 varas (1,049.32 feet);

Thence, with said curve to the left, continuing with said common boundary line of 138.876 acre Tract 1 and southeast 400.00 foot right-of-way line of State Highway No. 361, in a northeasterly direction, an arc distance of 377.76 varas (1,049.32 feet), to a 2 inch iron pipe found, at the point of tangent;

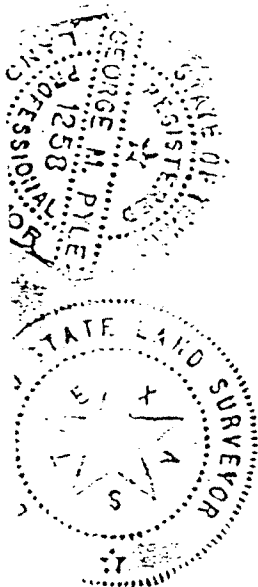
Thence, North 30° 20' 34" East, continuing with above described common boundary line of said 138.876 acre Tract 1 and southeast right-of-way line of State Highway No. 361, a distance of 110.80 varas (307.78 feet), to the **PLACE OF BEGINNING** and containing 182.675 acres of land.

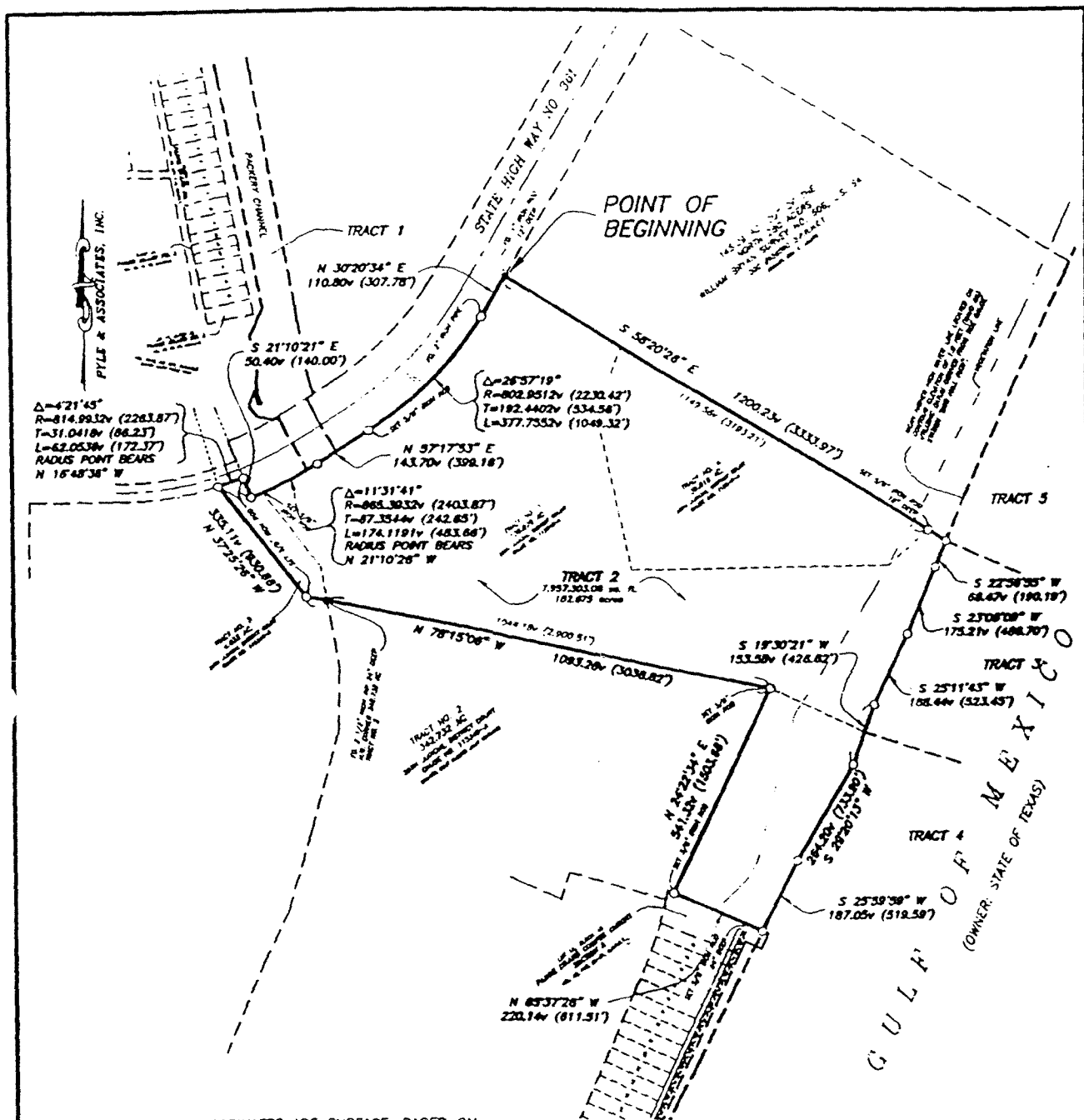
Pyle & Associates, Inc.

George M. Pyle

George M. Pyle

R.P.L.S. No. 1258, L.S.L.S.





BEARINGS AND COORDINATES ARE SURFACE, BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205), NAD 83, AND REFERENCED TO NATIONAL GEODETIC SURVEY MONUMENTS, SP 020 AND SO 020.

EXHIBIT TO ACCOMPANY METES AND BOUNDS DESCRIPTION OF

A 182.675 ACRE TRACT OF STATE OWNED LANDS BEING ALL OF THOSE CERTAIN TRACTS OF LAND DESIGNATED AS TRACT 1 (138.876 ACRES), TRACT 4 (39.819 ACRES) AND TRACT 5 (4.033 ACRES), DESCRIBED IN FINAL JUDGMENT OF THE 28TH JUDICIAL DISTRICT COURT, CAUSE NO. 115,340-A, ALL SITUATED IN NUECES COUNTY, TEXAS

P PYLE & ASSOCIATES, INC.
 PROFESSIONAL LAND SURVEYORS
 5282 SOUTH STAPLES, SUITE 350-A
 CORPUS CHRISTI, TX 78411
 PHONE: (361) 993-4191
 FAX: (361) 993-0967

Attachment A-13C

Dune Mitigation Plan

The procedure for construction of new dunes and the procedure for revegetation of newly constructed dunes are outlined below (see attached map).

Procedure for construction of new dunes:

1. Dune reconstruction will be achieved by mechanical and vegetative means using the following procedures:
 - a. Relocate the displaced dunes (5,670 cubic yards) by truck to the mitigation area located immediately to the north in a depression landward of the foredune ridge.
 - b. Restore approximately 5,670 cubic yards of critical dunes to approximate, naturally formed position, sediment content, volume, elevation, and vegetative cover.
 - c. Restore or repair critical dunes using indigenous vegetation that will achieve the same protective capability or greater capability as the surrounding natural dunes.
2. Reconstruction of critical dunes shall be achieved in the designated area with as little disturbance as possible to existing critical dunes. In the event that minor alteration to existing critical dunes becomes necessary to gain access to the mitigation areas, the dunes shall be revegetated and returned to their original condition as part of the mitigation process.

Procedure for revegetation of dunes:

1. The area of revegetation includes the "cut" area left from the removal of the displaced dunes, the temporary truck route, and the mitigated dunes. The areas of mitigation will be mulched with a thick mat of native hay mulch approximately 1" thick.
2. The mulch will provide for erosion protection until vegetation is established, as well as providing a source of seed for new vegetation. The mulch will also encourage the establishment of wind borne seed which will be able to establish at a faster rate due to the mulch coverage.
3. Native hay obtained from mowing and baling operations on Mustang or Padre Island will be utilized in order to allow for the seeding from indigenous species of vegetation. Hay containing mature seed head will increase the speed of coverage for the mitigation site and is preferred for this use.

4. The mitigation mulching will be installed immediately following relocation of the mitigated dunes.
5. The area will be inspected periodically after mulching. Additional hay mulch will be applied to bare areas as necessary to prevent excessive erosion and to encourage revegetation.
6. The revegetation site will be monitored and maintained until the vegetation cover matches or exceeds the level of vegetation on the surrounding naturally formed dunes.
7. Successful revegetation is required to have occurred within 3 years from the date of the beginning of the mitigation efforts.

Attachment 15



City of
Corpus
Christi

March 19, 2002

Mr. Shawn Hardeman
Coastal Geologist
Resource Conservation Division
Texas General Land Office
1700 North Congress Avenue, Suite 617
Austin, Texas 78701-1495

Ms. Priscilla M. Hubenak
Assistant Attorney General
Natural Resources Division
Office of the Attorney General
1700 West 15th, 10 Floor
Austin, Texas 78701

RE: Beachfront Construction Certificate Application for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel)

Dear Mr. Hardeman and Ms. Hubenak:

Attached is a copy of the Beachfront Construction Certificate application for the proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel) on Mustang Island in Nueces County, Texas. The application is categorized as large-scale construction since the area of construction is over 5,000 square feet in area. The actual construction area is 280 acres including the beach nourishment area.

The City of Corpus Christi is the sponsoring local government for this public improvement project. This project is authorized by the U.S. Congress and is being constructed by the U.S. Army Corps of Engineers (USACOE). The City of Corpus Christi does not have jurisdictional control of the project over the channel, jetties and bulkheads, and assumes the USACOE is taking the project through the Texas Coastal Management Program consistency review. The City, however, can exercise preferences as to the placement of fill of beach nourishment areas and recreational facilities.

Significant federal, state, and local funds are being contributed to this \$30 million dollar project. Of that total amount, \$1,250,000 is being contributed through the Coastal Erosion Planning and Response Act by the General Land Office. The GLO awarded the funds in February 2002 and must be expended by August 31, 2003.

The Dune Protection Permit was submitted to Nueces County on March 18, 2002.

The 100% construction plans (Enclosure 4 of the application) includes excavation of the channel with construction of the jetties and bulkheads, filling behind both bulkheads, and beach nourishment. The public amenities indicated in Enclosure 2 of the application will be constructed in Phase II of the Project. These public amenities will include two public bathhouses, a four-bay public boat ramp, beach parking, and over 4,000 feet of public walkways along the new shoreline areas.

The City of Corpus Christi finds the following.

1. Portions of the proposed construction are located seaward of the Erosion Area Line. This is necessary to reestablish an entrance from the Gulf of Mexico to Corpus Christi Bay, to correct the effects of man-made changes to the bay system's hydrology through the construction and maintenance of the Corpus Christi Ship Channel at Port Aransas. The

Packery Channel
Beachfront Construction Certificate Application
March 19, 2002
Page 2

construction and maintenance of the Corpus Christi Ship Channel at Port Aransas caused the natural pass of Packery Channel to silt in. This project will reestablish a direct route for water exchange and marine life to migrate between the waters of Corpus Christi Bay and the Upper Laguna Madre and the Gulf of Mexico.

2. The proposed construction does not functionally support or depend on, or otherwise relate to existing structures that encroach on the public beach and only supports proposed structures that are integral parts of the project and public access amenities.
3. The proposed construction, within 200 feet landward of the vegetation line, does include retaining walls (jetties and bulkheads) and impervious surfaces (8 foot wide walkways in Phase II).
4. The proposed construction will not diminish public access to the Gulf beach, and will in fact, enhance public access to the Gulf beach. Significant beach nourishment and construction of protected beach parking and numerous public amenities (Phase II - including two bathhouses, a four-bay public boat ramp, and over 4,000 feet of public walkways along the new shoreline areas) will be constructed.
5. The proposed construction is consistent with the City of Corpus Christi's Beach Access Plan and applicable state law.

Pursuant to the 10 working day period for state agency review provided by the Beach/Dune Rules, the Beachfront Construction Certificate application is scheduled to be acted on by the City of Corpus Christi Concurrent Beach/Dune Committee on April 10, 2002. The City's Planning Commission serves as that Committee. Please provide comments by April 5, 2002 (FAX # 361-880-3590).

Should you have any questions or need additional information, please call Mic Raasch or me at (361) 880-3560.

Sincerely,



Michael Gunning, AICP
Director of Planning

Attachment

cc: ✓ Honorable Nueces County Judge Richard Borchard
Jay Reining, First Assistant City Attorney
Doyle Curtis, Assistant City Attorney
Mic Raasch, AICP



**DUNE PROTECTION PERMIT/
BEACHFRONT CONSTRUCTION CERTIFICATE/
MATER PLANNED DEVELOPMENT
APPLICATION FORM**

PERMIT/CERTIFICATE/MPD NO: BCC010302 BASE MAP NO.: _____

CONCURRENT BEACH/DUNE COMMITTEE MEETING: 4/10/02

DATE REC'D: 3/18/02 REC'D BY: [Signature] FILING FEE: N/A

- 1) (a) APPLICANT: City of Corpus Christi PHONE: (361) 880-3507 FAX: (361) 880-3501
(b) ADDRESS: 1201 Leopard St., Corpus Christi, TX 78401
(c) STATUS OF APPLICANT: Property Owner _____ Other (Specify): Lessee of GLO property

- 2) (a) ENGR./SURVEYOR: Felix H. Ocañas, Jr. PHONE: (361) 853-8824 FAX: (361) 806-2573
(b) ADDRESS: 4601 Cody Lane, Corpus Christi, TX 78413
(c) CONTACT PERSON: Felix H. Ocañas, Jr.

- 3) (a) OWNER: Texas General Land Office PHONE: (512) 463-5055 FAX: (512) 463-5304
(b) ADDRESS: 1700 N. Congress Avenue, Austin, TX 78701-1495

- 4) (a) PROPOSED DEVELOPMENT NAME: NORTH PADRE ISLAND STORM DAMAGE
REDUCTION AND ENVIRONMENTAL RESTORATION PROJECT
(b) ADDRESS/LOCATION: PADRE ISLAND, CC, TX (c) ACREAGE/SQ. FOOTAGE: Approx. 182 acres
(d) LEGAL DESCRIPTION: See Enclosure I
CITY LIMITS
(e) IN ☒ OUT ☐ (f) ZONING: R-1B, AT (g) PROPOSED REZONING: N/A
(h) LAND USE
Existing: Vacant Proposed: Park/Channel (i) PROPOSED NO. OF PHASES: Phase I –
channel, jetties, bulkhead, filling; Phase II – park facilities
(j) DURATION OF CONSTRUCTION
From: Dec. 2002 To: Dec. 2004 (k) PROP. NO. OF STRUCTURES/RESIDENTIAL UNITS
Habitatable: N/A Amenity: Recreational Facilities
(l) NO. OF PARKING SPACES
Existing: 0 Proposed: 945 (m) OPEN SPACE
Existing: 569 acres/100% Proposed: 15.0 acres 3%
(n) WATER SERVICE:
() Water Well
(X) City Water
() Other – Specify: _____ (o) SEWER SERVICE:
() Septic System
(X) City Sewer
() Other – Specify: _____

NOTE: Page 1 of 3. If more space is needed on any item, attach separate sheet(s) with corresponding reference numbers and letters.
(One additional sheet added).

I certify that the information provided herewith is accurate and correct.

[Signature] 03/18/02
FOR Angel R. Escobar, P.E. Date: 3/18/02
(Applicant's Signature)

[Signature]
Felix H. Ocañas, Jr., P.E., #33006 Date: 3/18/02
(Engineer's/Surveyor's Signature and license number)

PERMIT/CERTIFICATE/MPD APPLICATION CHECKLIST:

Applicants shall submit the following:

- ☒ 10 complete copies of application.
- ☒ Floor plans and elevation views of structures proposed to be expanded or constructed. (Encl. 2)
- ☒ Description of any existing or proposed walkways or dune walkovers on the tract. (Encl. 2) *(Additional sheet)*
- ☒ Grading and layout plan identifying all existing and proposed structures and paved areas, elevations (in reference to NOAA datum), existing contours of the project area and proposed contours for the final grade (minimum 2 foot contour intervals required for existing and proposed contours), Dune Protection Line, Erosion Area Boundary, Vegetation Line, Mean High Tide Line, and all FEMA flood zone boundaries. (Encl. 2)
- ☒ Photographs of the site which clearly show the current location of the vegetation line and existing dunes on the tract. (Encl. 2)
- ☒ Effects of the proposed activity on the beach/dune system which cannot be avoided should the proposed activity be permitted, including, but not limited to, damage to dune vegetation, alteration of dune size and shape, and changes in dune hydrology. (See Nueces County Dune Protection Permit Application)
- ☒ Comprehensive mitigation plan which includes a detailed description of the methods and respective timeframes which will be used to avoid, minimize, mitigate and/or compensate for any adverse effects on dunes or dune vegetation including use of non-indigenous vegetation. (See Nueces County Dune Protection Permit Application)
- ☒ Proof of financial capability to mitigate or compensate for adverse effects on dunes and dune vegetation, or to fund eventual relocation or demolition of structures.

Applicants shall submit an accurate map or plat of the site identifying the:

- ☒ a. Site by its legal description, including, where applicable, the subdivision, block, and lot and city limit lines. (Encl. 1)
- ☒ b. Location of the property lines and a notation of the legal description of adjoining tracts. (Encl. 1)
- ☒ c. Location of the structures, the footprint or perimeter of the proposed construction on the tract. (Encl. 2)
- ☒ d. Proposed roadways and driveways and proposed landscaping activities on the tract. (Encl. 2)
- ☒ e. Location of any seawalls or any other erosion response structures on the tract and on the properties immediately adjacent to the tract (Encl. 4)
- ☒ f. Location and extent of any man-made vegetated mounds, restored dunes, fill activities, or any other pre-existing human modifications on the tract. (Encl. 4)
- ☒ g. Development name, north point, scale, date, vicinity sketch or location map and direction of prevailing breeze. (Encl. 4)
- ☒ h. Location, width and name of existing and proposed streets, blocks, lots, alleys, and easements with principal dimensions, or other significant features within 200 feet of development. (Encls. 2 and 4)
- ☒ i. General plan of stormwater drainage indicating location and direction of flow. (Encls. 2 and 4)
- ☒ j. Location and depth of existing and proposed water areas and wetlands (as determined by U.S. Corps of Engineers) and other significant land and water feature within 200 feet of development. (Encls. 2 and 4)

For all proposed large-scale construction, applicants shall submit the following items and information:

- ☒ If the tract is located in a subdivision and the applicant is the owner or developer of the subdivision, a certified copy of the recorded plat of the subdivision, or, if not a recorded subdivision, a preliminary plat of the subdivision certified by a licensed surveyor, and a statement of the total area of the subdivision in acres or square feet.
- ☒ Alternatives to the proposed location of construction on the tract or to the proposed methods of construction which would cause fewer or no adverse effects on dunes and dune vegetation or less impairment of the beach access.
- ☒ The proposed activity's impact on the natural drainage pattern of the site and adjacent lots. (Encl. 4) See drawings C-10 and S-8.

For all proposed construction (large- and small-scale), if applicants already have the following items and information, the applicant shall submit, in addition, the other information required above:

- ☒ A copy of a site plan of the proposed construction. (Encls. 2 and 4)
- ☒ A copy of a topographical survey of the site (minimum 2-foot contour intervals) (Encl. 2)
- ☒ The most recent local historical erosion rate date (as determined by the University of Texas at Austin, Bureau of Economic Geology) and the activity's potential impact on coastal erosion.
- ☒ A copy of the FEMA "Elevation Certificate." Design of maintenance building and other structures not completed. Not enough information is available to complete certificate. Certificates to be submitted at a later date.

PERMIT/CERTIFICATE/MPD APPLICATION CHECKLIST (CONTINUED):

applicants shall provide the following information when proposing off-site compensation for dunes and dune vegetation:

- N/A Name, address, phone number, and fax number, if applicable, of the owner of the property where the off-site compensation is proposed to be located;
- N/A Legal description of property proposed to be used for off-site compensation;
- N/A Source of the sand and dune vegetation to be used;
- N/A All information regarding permits and certificates issued for the restoration of the dunes and dune vegetation on the proposed compensation site;
- N/A All relevant information regarding the success, current status, and stabilization of the dune restoration efforts on the proposed compensation site;
- N/A Any increase in potential flood damage to the site where the adverse effects on dunes and dune vegetation will occur and to the public and private property adjacent to that site; and
- N/A Proposed dates of initiation and completion of the compensation.

NOTE: The following enclosures address all the items listed in the checklist above:

- Enclosure 1: Registered survey and metes and bounds description.
- Enclosure 2: Public and Environmental Facilities layout plan.
- Enclosure 3: Aerial photo dated December 8, 2000.
- Enclosure 4: U.S. Army Corps of Engineers 100% design documents for the North Padre Island Storm Damage Reduction and Environmental Restoration Project.

NORTH PADRE ISLAND STORM DAMAGE REDUCTION AND ENVIRONMENTAL
RESTORATION PROJECT

BEACHFRONT CONSTRUCTION CERTIFICATE
APPLICATION FORM
(additional sheet)

It is proposed to re-open Packery Channel by dredging from Texas State Highway 361 to about 1,500 feet beyond the shoreline and to dredge the existing channel from the SH361 bridge to the Gulf Intercoastal Waterway. Approximately one million cubic yards of dredged material will be placed along the beach and in the 3 other placement areas. Jetties 2,178 feet long will be constructed on both sides of the channel as shown on drawing C-2, Enclosure 4. Approximately 132,000 tons of stone of different sizes will be used to build the jetties, see drawings C-51 and C-52. Concrete bulkheads will be constructed on both sides of the channel beginning at the landward end of jetties and extending to the SH361, see drawing C-2, S-1 through S-7. Approximately 13,000 tons of rip rap type stone will be used for toe protection of the bulkheads. Sand will be placed behind the bulkheads as shown on drawing C-30 and C-31, to elevation +5.25 and extending to the existing flood protection wall on the south side of the channel and extending 130 feet on the north side of the channel where a steel sheet pile wall will be constructed to hold the sand in place. The sand will be graded. Recreation facilities will be constructed on the sand fill area on the north side of the channel. The facilities will include parking areas, bath houses and a maintenance building as shown on Enclosure 2.

Beach nourishment will be done on the south side of the channel as shown on drawings C-33 to C-44. The area of beach nourishment is about 7,500 feet by 220 feet. Approximately 530,000 cubic yards of sand will be placed along the beach.

All of the sand dredged from the channel will be placed in placement areas 1, 2, and 3 and along the beach. Cross section of the before and after conditions are shown on drawings C-40 through C-44.

The existing dune sand where the channel will be re-opened will be relocated in the same general area adjacent to the existing dune system, in the lower areas, and will be revegetated.

Description of any existing or proposed walkway or dune walkover on the tract:

Eight foot-wide concrete publicly accessible walkways will be provided adjacent to both the north and south bulkheads along the channel and on top of both of the jetties. These walkways will be constructed between the seagate and the end of the jetties on the south side of the channel (approximately 2,000 feet in length) and between the boat ramp and the end of the jetties on the north side (approximately 2,000 feet in length). These walkways will be ADA compliant. Dune walkovers are not anticipated to be constructed with this project.

Changes in Gulf Shoreline Position, Mustang, and North Padre Islands, Texas

**James C. Gibeaut, Tiffany Hepner, Rachael Waldinger, John Andrews, Roberto Gutierrez, Thomas
A. Tremblay, Rebecca Smyth
With assistance from Liying Xu**

**A Report of the Texas Coastal Coordination Council pursuant to National Oceanic and Atmospheric
Administration Award No. NA97OZ0179
GLO Contract Number 00-002R**



**Bureau of Economic Geology
Scott W. Tinker, Director
The University of Texas at Austin
Austin, Texas 78713-8924**

May 2001

were measured using a Sokkia Set 5W Electronic Total Station and a reflecting prism. Vegetation, sediment type, and geomorphic features were noted along each transect line. Navigation back to the marker locations will be possible using real-time differential GPS.

Beach profiles are plotted relative to the orthometric heights derived using GEOID99 (Appendix). Also included on the data plots is the location of approximate local mean sea level. Local mean sea level was determined by examining tide gauge data from Bob Hall Pier on north Padre Island. Approximate location of mean sea level on the transects was determined by the offset of the water level from mean sea level at the time the position of the water line was obtained for each transect. Also included on the profile plots is the designation of the datum marker, vegetation line, wet/dry line, and water line at the time of the survey.

Average Annual Rate of Shoreline Change

The purpose of calculating the average annual rate of shoreline change is to provide an indication of likely future changes. Therefore, shorelines from a time before permanent and significant engineering changes were made are not used in the calculation. From Aransas Pass to the Padre Island National Seashore, shorelines prior to the jetty and channel construction at Aransas Pass are not used. The dredged channel and jetties at Aransas Pass, which were largely in place by 1911 (U.S. Army Corps of Engineers, 1992), interrupt southerly littoral drift affecting the long-term sediment budget along Mustang Island. The enhanced tidal exchange through the pass may also affect the length of time the storm surge channels of Packery, Newport, and Corpus Christi Passes remain open after storms. Dredging and jetty maintenance at Aransas Pass has proceeded since 1911 and will continue for the foreseeable future. Therefore, shorelines used to determine the average annual rate of shoreline change are from 1937, 1956/58/59, 1965/69, 1974, 1990/95, and 2000.

Figure 3 is a plot of the long-term average annual rate of shoreline change. The shoreline is overall retreating with an area of stability or slight seaward advancement for 7 km of shoreline south of the Aransas Pass jetty, and in 2 local areas around the fish pass and Corpus Christi Pass. The fish pass was dredged and jettied in August 1972. Even

though it closed naturally in 1979, the 2 rock jetties remain and extend seaward 160 m from the 2000 shoreline. The jetties have interrupted the littoral drift causing stabilization or slight advancement of the shoreline 1 km to the south and 0.5 km to the north. The local stabilization of the shoreline around Corpus Christi Pass is anomalous and reflects the closing of the pass in 1943 after having been dredged in 1938 (U. S. Army Corps of Engineers, 1992).

There are 3 areas where moderate shoreline retreat is punctuated by relatively high retreat rates. These areas are 7 to 11 km south of the Aransas Pass jetty, a 3 km area around Newport Pass and a 3-km stretch of shoreline south of Bob Hall Pier. Inspection of the beach profiles (appendix) reveals that the foredunes and secondary dunes are generally lower in elevation in the high retreat areas compared to those in the relatively stable areas. For example, NPI-07 is in an area with a retreat rate of almost 2 m/yr and the foredune and secondary dunes have an elevation of about 4 m. Five kilometers to the south at profile NPI-06 the retreat rate decreases to 0.5 m/yr and the dune complex reaches about 7 m elevation. A similar comparison can be made between the relatively high retreat rate, low-elevation profile at MUI-06 and the low retreat rate, high elevation profile at MUI-05 (Fig. 1, appendix).

Discussion and Conclusions

Overall, the Gulf of Mexico Shoreline between Aransas Pass and the north boundary of the Padre Island National Seashore is retreating. However, there are several scales of alongshore variability in the average annual rate of shoreline change. Some of this variability is caused by human alterations. Engineering modifications at Aransas Pass have changed the sediment budget by trapping sand in the littoral drift system on both sides of the pass. As a result, the shoreline position is more stable for a distance 6 km to the south of the pass than it otherwise would be. Farther to the south of the pass, the overall retreat of the shoreline is probably enhanced because of the sand trapping. The modifications at Aransas Pass have also created a more efficient channel for tidal exchange with Corpus Christi Bay. This effects shoreline dynamics along Mustang and North Padre Islands by limiting the flow through the storm channels to the south causing

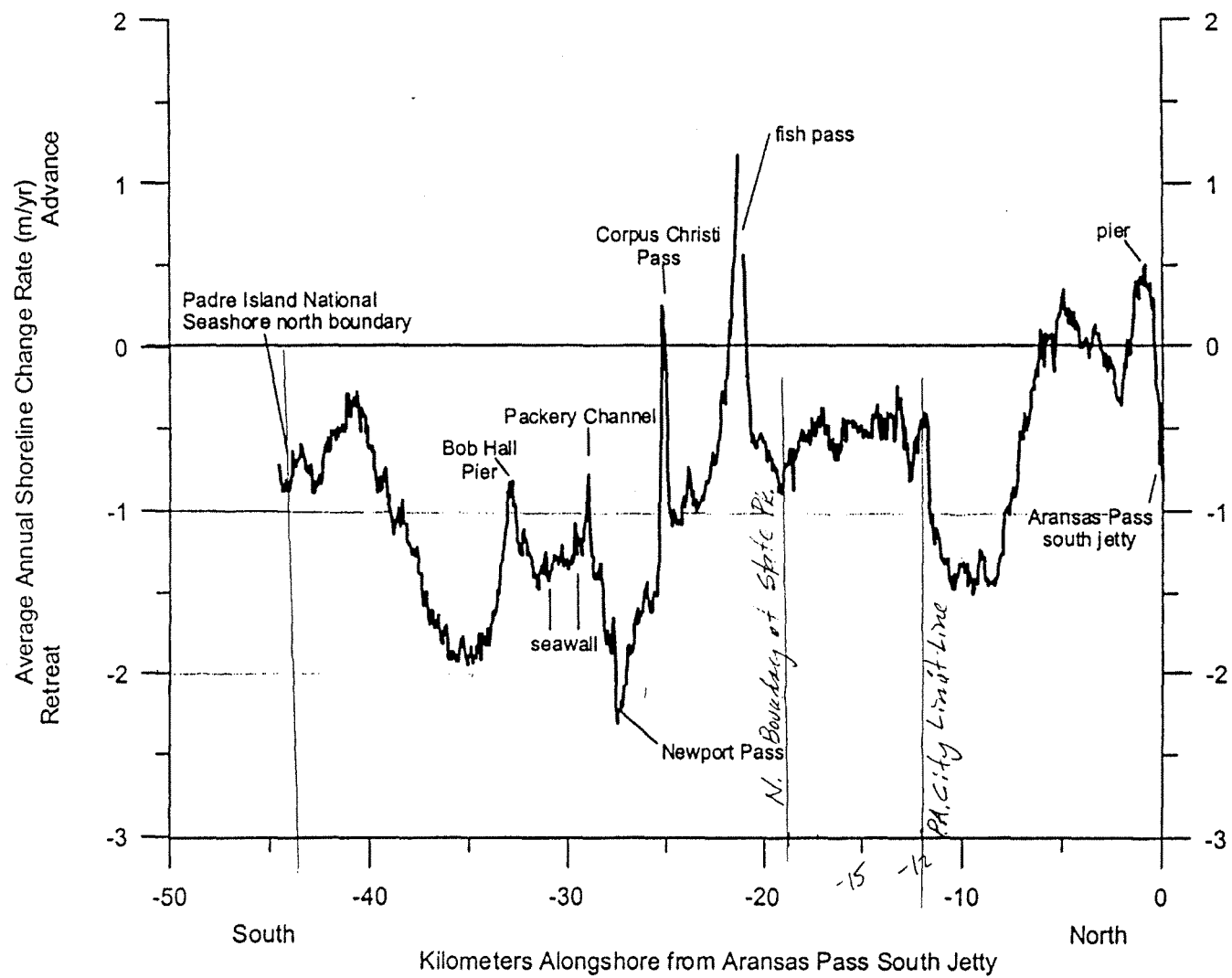


Figure 3. Long-term average annual rate of shoreline change. Six shorelines from 1937, 1956/58/59, 1965/69, 1974, 1990/95, and 2000 were used to determine rate of change based on a linear regression model.

them to close relatively quickly after storms. Modifications at Corpus Christi Pass and the Corpus Christi Water Exchange Pass (fish pass) have had large but only local effects. The piers and seawall have only caused minor alterations in the shoreline change rates (Fig. 3).

The most interesting variations in the average annual shoreline change rates are the areas of relatively high retreat south of Bob Hall Pier, around Newport Pass, and 7 to 11 km south of Aransas Pass. The cause of the higher retreat rates is not known specifically, but probably reflect variations in littoral drift rates or the amount of wave energy reaching the shoreline. The better-developed dunes in the low-retreat areas compared to the high-retreat areas suggest that the dunes are storing greater amounts of sand in the low retreat areas, which may enhance even further the high retreat rates along adjacent shorelines. The relationship between dune development and long-term retreat rates will be further investigated using the detailed topographic data from the LIDAR survey.

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City of
Corpus
Christi

March 18, 2002

Mr. David R. Garcia, City Manager
City of Corpus Christi
P.O. Box 9277
Corpus Christi, TX 78469

Subject: Packery Channel Project Elevation Certificate

Dear Mr. Garcia,

In response to an inquiry regarding the Elevation Certificate for the Packery Channel project, it is my opinion as the Floodplain Manager for the City of Corpus Christi that submittal of an Elevation Certificate O.M.B. No. 3067-0077 at this stage of the project is not necessary as a part of the Corps of Engineers packet.

The scope of the project for this initial stage contains no habitable structures below the BFE. The scope is limited to dredging and the construction of bulkheads and flatwork less than the vertical heights as prescribed in the City of Corpus Christi Building Code.

I am in receipt of an elevation survey and certificate from the City of Corpus Christi that I will retain in my files. When the project scope includes the design and construction of any structures with BFE implications, the Elevation Certificates will be requested by my office in advance of any planning and design.

Sincerely,

Arthur N. Sosa, Architect
Building Official/Floodplain Manager

CC: George K. Noe, Deputy City Manager
Ron Massey, Assistant City Manager
Angel R. Escobar, P.E., Director of Engineering Services
File

Attachment C-4



APPENDIX D

SECTION 404(b)(1) EVALUATION

APPENDIX D
SECTION 404 (b) (1) EVALUATION
North Padre Island Storm Damage Reduction and Environmental Restoration Project
Packery Channel, Corpus Christi, Texas

I. Project Description

a. Location

The study area for Packery Channel encompasses the area between the boundary of the Upper Laguna Madre and Corpus Christi Bay to the north and the intersection of Laguna Madre and Baffin Bay to the south. The southern limit of the study area was extended to Baffin Bay since earlier modeling results exhibited changes extending to this location, whereas modeling results toward Corpus Christi Bay showed little change (not unexpected since the shallow Laguna Madre joins the much deeper bay). The proposed Packery Channel project will provide a dredged channel across North Padre Island between the Upper Laguna Madre and the Gulf of Mexico. The existing channel is located northeast of the John F. Kennedy (JFK) Causeway, which crosses the Laguna Madre between the city of Corpus Christi and Padre Island. The existing channel is largely the result of the modern dredging of a historically shallow cut between what was the historic pass and Laguna Madre.

The total length of the proposed channel from the Gulf end of the jetties to the Gulf Intracoastal Waterway is approximately 18,500 feet (3.5 miles). The alignment is not straight but follows an existing channel from the bay, which would be extended east-southeast approximately 4,500 feet toward the Gulf.

b. General Description

The length of the proposed channel from the Gulf end of the jetties to the Gulf Intracoastal Waterway (GIWW) is approximately 18,500 feet (3.5 miles). The Packery Channel alignment follows an existing channel southeast of the GIWW for approximately 2.6 miles to a basin southeast of State Highway 361 (SH 361). From this basin the proposed new channel will extend approximately 0.9 mile toward the Gulf. Packery Channel will allow water exchange and passage for aquatic organisms between the Gulf and the Upper Laguna Madre. Sand from construction and periodic maintenance will be placed on the beach to help stabilize the existing seawall. The project will also allow recreational and small commercial boats access between the GIWW and the Gulf. Traffic will not include large commercial ships, tows, deepwater draft barges, or any floating vessel with a draft greater than 4 feet. The proposed recreational development by the City of Corpus Christi, considered secondary development, will include construction of parking lots, access roads, walkways, restroom facilities, vendor kiosks, and a boat ramp. These actions by the City are not part of the Project.

According to the design engineer, URS (2002a), the proposed channel opening involves dredging a new channel from the Gulf into the existing basin area (Inner Basin) located southeast of the SH 361 bridge (Reach 1). Two rock jetties will extend from the shoreline approximately 1,400 feet paralleling the

channel. The Inner Basin will be widened and deepened. The existing Packery Channel west of SH 361 (Reach 2) that extends to the GIWW will also be widened and deepened.

Southeast of the SH 361 bridge in Reach 1, the channel width varies at the Inner Basin from 80 feet expanding to 745 feet at the channel bottom. From the crest to the crest of the shoreline armoring the width is 800 feet at the widest. The proposed new channel extending from the basin toward the Gulf will narrow to a channel bottom width of approximately 122 feet with an approximate 280-foot span (crest to crest of the shoreline armoring). The channel depth proposed is -12 feet MLLW plus 2 feet advanced maintenance and 2 feet of allowable overdepth.

Within Reach 2, the depth of the channel is proposed at a required depth of -7 feet MLLW with 1 foot allowable overdepth. The channel bottom width is designed for 80 feet along Reach 2, and the side slopes may extend the width to approximately 110 feet in certain areas.

Sandy dredged material will be deposited on the beach, east of the seawall, to nourish eroding beaches and provide protection from storm events. Fine-grained dredged material will be placed in designated areas adjacent to the channel in Reach 1.

Channel shoreline protection consisting of 3H:1V slopes armored with cellular concrete mattresses (CCM) are proposed on the north and south sides of the channel from the western end of the jetty to the SH 361 bridge (Reach 1). Behind the armored slopes new fill material is required in placement areas (PA) PA 1, PA 2, and PA 3 to bring the ground elevation to grade with the top of the armoring. The beach nourishment area (PA 4S) will be located south of the jetties and seaward of the seawall. Another proposed beach nourishment area (PA 4N) is located on the north side of the jetties for use of sandy maintenance material, if necessary.

Approximately 916,700 cy of new work material will be dredged. An additional 50,800 cy of material must be excavated from PA 1 before dredged material can be placed in it, resulting in a total of 967,500 cy. The material will be placed at the four dredged material placement areas covering approximately 104.3 acres. Two maintenance material locations are also proposed: PA 4N (14.4 acres) and an emergent island disposal area (MMPA) north of the channel (10.5 acres).

PA 1 is approximately 14.0 acres in size. Placement volume for PA 1 is 131,900 cy.

Shoreline armoring with CCM will be constructed on the north and western sides of PA 1 and act as retaining structures. The existing floodwall will serve as the southern retaining structure. A levee will be constructed on the eastern end. Drainage will be directed toward the channel via a catch basin.

PA 2 is an approximate 13.7-acre placement area that will contain a volume of 59,300 cy. Armored shorelines using CCM will be constructed along the south perimeter. Slope armoring will be constructed partially across the northern and western boundary of PA 2. Two openings of approximately 550 and 250 feet along the northern perimeter will allow for fill material in PA 2 to grade into existing ground level (secondary dunes) on the north side. Drainage will be directed toward the channel.

The approximate 4.3-acre PA 3 will contain a volume of 26,200 cy. Cellular concrete mattresses are proposed along the Inner Basin and will serve as the eastern retaining structure for PA 3. The

existing floodwall serves as the southern retaining structure, and a levee at the SH 361 embankment provides the western containment.

New work material comprised primarily of sand will be used for beach nourishment at PA 4S along the existing seawall to extend the eroding beach and thereby assist the protection provided by the seawall from major storm events. An approximately 72.3-acre area for beach nourishment will be located south of the jetties. All material in Reach 1 is suitable for beach placement due to the predominant composition of sand. Sediment from portions of Reach 2 is also appropriate for beach placement. PA 4N extends along the beach north of the jetties, covering approximately 14.4 acres. Channel sands will be deposited as needed to nourish the beach north of the jetties.

Another maintenance material placement area (MMPA) is proposed north of the channel on emergent lands east of PA 174. Material inappropriate for beach placement will be placed in this confined upland disposal area. This PA will encompass approximately 10.5 acres of undeveloped property and accommodate anticipated maintenance dredging of 15,000 cy of material every 5 years for the 50-year project life.

The project design proposes constructing two rock jetties with sidewalks at the crest of each jetty. The proposed jetties will parallel the channel onshore and offshore, starting approximately at Station 174+00. For both jetties, construction on shore extends approximately 800 feet. The north jetty extends from the shoreline outward approximately 1,432 feet, and the south jetty extends approximately 1,482 feet. The jetties will be oriented at 12 degrees north of shore-normal to provide shelter from southeasterly summer waves. Jetty elevation is proposed at 7.25 feet MLLW with a jetty crest width of 10.5 feet. The footprint at the base of each jetty is approximately 60 feet wide. The approximate distance between the two jetty crests is 280 feet with the channel width of approximately 122 feet at -14.0 MLLW.

The estimated annual accumulation of sand in Reach 1 is 54,750 cy. Maintenance dredging is proposed biennially. The majority of deposition will be transported by currents and be located toward the end of the jetties. Windblown sand deposition is also included in this annual dredge volume. It is anticipated, however, that maintenance dredging will occur about every two years.

A sand bypassing system is proposed to move the sand that accumulates in the area updrift of the jetty. The average mechanical bypassing volume of sand to maintain current shoreline position is 160,000 cy/year. The maintenance schedule will be determined by the extent of the sand accretion on the upside of the jetty.

To mitigate for the Project, the City of Corpus Christi will provide \$1,250,000 to the CBBEP, which will oversee habitat creation, including SAV habitat and construction of a breakwater, on Shamrock Island, a Nature Conservancy preserve in Corpus Christi Bay. The City of Corpus Christi shall be responsible to the GLO and the School Land Board for the successful completion of this project.

The City of Corpus Christi has proposed secondary recreational development around the channel. Parking facilities, walkways along the channel, in Reach 1, access roads, vendor and restroom facilities, and a boat ramp have been proposed. This proposed development is a separate action by the City.

c. General Description of Dredged or Fill Material

(1) General Characteristics of Material

New work material will be dredged to open the channel. A description of the new work material is in the FEIS, Sections 1.2 and 3.3. The majority of all new work material is sand. Reach 1, east of the SH 361 bridge, is predominantly sand, while Reach 2, though comprised of sands, has a greater percent fines content in some portions. Maintenance material from Reach 1 will be placed on the beach, while maintenance material from Reach 2 that is not suitable for the beach will be placed in the MMPA.

(2) Quantity of Material

Table 1 provides the quantities, by reach, of the new work and maintenance material expected from the preferred alternative.

Table 1. Quantities of New Work and
Maintenance Dredged Material (cy)

Reach	New Work Material	Maintenance Material (50 years)
East of SH 361 Bridge (Reach 1) *	842,300	2,737,500
West of SH 361 Bridge (Reach 2)	125,200	320,000
Sand Bypass **		8,000,000
TOTAL	967,500	11,057,500

* Includes 50,800 cy one-time excavation from PA 1.

** Estimated annual accumulation (160,000 cy).

(3) Source of Material

All dredged material will come from the excavation and subsequent maintenance of Packery Channel.

d. Description of the Proposed Discharge Sites

(1) Location

An estimated 967,500 cy of material will be dredged. The dredged material will be placed in four placement areas: PA 1 – 131,900 cy of new work material on the south side of the channel between the existing seawall and the proposed shoreline protection bulkhead (50,800 cy will be excavated from PA 1 to provide necessary volume for channel new work material); PA 2 – 59,300 cy of new work material on the north side of the channel to the north of the proposed shoreline protection bulkhead; PA 3 –

26,200 cy of new work material on the south side of the channel between the existing seawall and the proposed shoreline protection bulkhead; and PA 4S – 744,430 cy of new work material on the beach on North Padre Island. PA 4 is also proposed for maintenance material placement. Approximately 5,670 cy of sand from dunes within the construction footprint will be relocated to the north and placed in a depression in the existing foredune ridge for mitigation from the loss of dunes. A proposed maintenance location on the beach, north of the jetties, will accommodate sandy material, if necessary. A proposed maintenance material placement area (MPPA) will accommodate 15,000 cy maintenance dredging every 5 years. A sand transfer system will be utilized to move sand from the areas north and south of the jetties to designated beach areas. Roadways, parking areas, walkways, and other recreational facilities have been proposed by the City of Corpus Christi as secondary development, not part of the Project.

(2) Size

The placement and maintenance areas will encompass approximately 133.8 acres:

PA 1 – 14.0 acres

PA 2 – 13.7 acres

PA 3 – 4.3 acres

PA 4S – 72.3 acres

PA 4N – 14.4 acres

MMPA – 10.5 acres

(3) Type of Site and Habitat

PA 1 – unvegetated sand (i.e., channel fill sand); primary and secondary dune complex; beach

PA 2 – primary and secondary dune complex; upland grassland; high salt marsh; tidal flats; submerged aquatic vegetation; beach; channel fill sands

PA 3 – upland grassland; high and low salt marshes; tidal flats; submerged aquatic vegetation; open water

PA 4N and PA 4S – beach sand; Gulf open water

MMPA – upland grassland, high salt marsh; tidal flats; submerged aquatic vegetation; open water

(4) Time and Duration of Discharge

The placement sites will be constructed during the dredging of Packery Channel. Proposed maintenance dredging is every 5 years for the reach west of SH 361 and biennially east of SH 361.

e. Description of Placement Method

Hydraulic cutterhead dredges and mechanical excavation are proposed for the channel excavation. Mechanical excavation will be used to manage material in PAs 2 and 3.

II. Factual Determinations

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope

The MMPA will be located on emergent land north of the channel east of PA 174. A levee with an elevation of approximately 20 feet above the existing ground elevation will be constructed to contain the maintenance material. PA 1 would have a levee on the east end and armored shoreline protection on the north and west sides, and existing floodwall on the south side so the sand would be allowed to mound to a proper elevation. PAs 2 and 3 would have 3H:1V armored slopes along the perimeter reaching approximately 5.25 feet MLLW on the channel sides and slightly ≥ 6 feet MLLW on opposing sides.

The recommended design template for the beach placement (PA 4S and N) is an approximate 450-foot-wide berm extending seaward from the seawall. The top elevation of the berm is 3 feet MLLW, which is approximately 2 feet above existing beach elevation. From the seaward edge of the berm, the fill will extend seaward with a slope of approximately 20H:1V and terminate at the third offshore bar. In addition, it may be necessary to construct small temporary retaining dikes along the landward edge and the seaward edge of the project area to contain the discharge as it is placed on the beach.

Sediment Type

The new work and maintenance material will mostly be sandy (93% overall, 68% in Reach 2). Results for new work material sediment analysis and grain-size distribution are presented in Table 3.2-2 of the FEIS.

Dredged/Fill Material Movement

Armored shoreline protection (cellular concrete mattresses) will be constructed to protect dredged/fill material from movement in the channel, and to provide additional protection during storm events. A drainage channel will take the supernatant from the dredged material in PA 1 to the channel. PAs 2 and 3 will be used to receive material that is mechanically excavated; therefore, there will not be return water associated with these areas. Some incidental water may be entrained during mechanical dredging, but the amount of water removed is considered to be *de minimis*.

(4) Physical Effects on Benthos

Nonmotile organisms occurring in the sediment in the dredged areas will be placed in PAs and will be buried. Placement of material in the proposed beach placement site would bury those benthic organisms incapable of escaping or burrowing up through the dredged material. Burial of organisms will occur during initial construction placement, but since the material is similar to bay bottom, and what presently exists on site, recolonization should be rapid.

(5) Other Effects

None known.

(6) Actions Taken to Minimize Impacts

Use of suitable material for beach nourishment will provide benefit to counter the erosional trend. During sand placement, small retaining dikes may be constructed along the landward side and seaward side to contain material. These retaining dikes will advance along the beach as necessary during the fill placement. In addition, sand fencing to prevent potential erosion will be used in appropriate locations.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water

One of the most dramatic changes that would be caused by the proposed project, would be the change in the water exchange patterns in the Upper Laguna Madre, via the new opening to the Gulf. However, dredging and placement operations are expected to have only minimal short-term impacts on water quality in the area. Impacts to water quality, primarily salinity, are discussed more fully in the FEIS Section 4.2.

(a) Salinity

The proposed project results in more exchange with the Gulf of Mexico and a change in salinity of a few parts per thousand in the vicinity of the inlet, and much smaller changes well into the Laguna Madre. (FEIS Section 4.2.2)

(b) Water Chemistry

The majority of the new work material and maintenance material is sandy, to which contaminants generally do not adhere. Aside from a temporary increase in local suspended solids, no negative impacts are expected (FEIS Section 4.2.3).

(c) Clarity

There will be some temporary increase in local turbidity during dredging and placement operations. Water clarity is expected to return to normal background levels shortly after operations are completed. The finer material from both construction and maintenance would be placed in upland sites, reducing the potential impacts from turbidity.

(d) Color

Water immediately surrounding the construction and maintenance dredging will become discolored temporarily due to disturbance of the sediment.

(e) Odor

Objectionable odors may result from dredging of sediments containing high levels of organic matter. There will be a short period when foul odors are emitted by the dredged material during construction and maintenance, though these odors are considered temporary.

(f) Taste

No detectable impacts in the marine environment.

(g) Dissolved Gas Levels

No dissolved gas levels except, perhaps, minor amounts of hydrogen sulfide are expected.

(h) Nutrients

Nutrient levels may be temporarily elevated near the PAs as sediments release their organic compounds.

(i) Eutrophication

Nutrients are not expected to reach levels high enough for periods long enough to lead to eutrophication of the surrounding waters.

(j) Others as Appropriate

None known.

(2) Current Patterns and Circulation

Model results show a decrease in tidal range at the vicinity of Packery Channel, with a maximum decrease of 0.09 foot. The PAs are not expected to adversely affect currents or circulation patterns (FEIS Section 4.2.1).

(a) Current Patterns and Flow

Minor impacts are expected due to the opening of the inlet. The PAs are not expected to adversely affect currents or flow conditions.

(b) Velocity

Minor impacts are expected. An increase in flow velocity is expected, though calculations by URS/Dames & Moore (2002a and b) do not indicate adverse side slope erosion.

(c) Stratification

No impacts are expected.

(d) Hydrologic Regime

Minor impacts are expected.

(3) Normal Water Level Fluctuations

The water level in the Packery Channel area will be subject to a more direct influence of the Gulf tide when the inlet is open, as a result, small effects are expected (FEIS Section 4.2.1).

(4) Salinity Gradients

There will be minor effects; i.e., a change in salinity up to a few parts per thousand under certain conditions (FEIS Section 4.2.2).

(5) Actions That Will Be Taken to Minimize Impacts

No actions required.

c. Suspended Particulate/Turbidity Determination

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site

An increase in suspended particulates and turbidity levels is expected during dredging, jetty construction, and placement operations. These are temporary and localized events.

(2) Effects on Chemical and Physical Properties of the Water Column

(a) Light Penetration

Turbidity levels will be temporarily increased during dredging and placement operations.

(b) Dissolved Oxygen

No adverse impacts to dissolved oxygen are expected.

(c) Toxic metals and organics

No adverse impacts are expected (FEIS Section 3.3.1).

(d) Pathogens

None expected.

(e) Aesthetics

The PAs have been designed to minimize impacts and adverse aesthetic qualities. The project will design potential SAV habitat, which may be ultimately beneficial to recreational fishermen by providing aquatic habitat. These areas will not be planted in SAV, nor considered as mitigation. Beach nourishment is proposed to alleviate the eroding shoreline and assist the protection provided by the existing seawall from storm events.

(f) Others as Appropriate

None known.

(3) Effects on Biota

Dredging of the channel and Inner Basin as well as the emplacement of jetties will impact approximately 5.2 acres of submerged aquatic vegetation, 4.8 acres of high salt marsh, 0.1 acres of tidal flats, 12.1 acres of channel fill sands, 1.0 acre of upland grassland, 1.7 acres of primary and secondary dunes, and 4.7 acres of beach. The placement of dredged material on PAs 1 through 4 and the MMPA will impact 0.2 acre of submerged aquatic vegetation, 12.7 acres of high salt marsh, 0.2 acre of low salt marsh, 1.8 acres of tidal flats, 3.8 acres of channel fill sands, 5.1 acres of upland grasslands, 18.4 acres of primary and secondary dunes, and 31.5 acres of beach for beneficial use.

The placement of dredged material on approximately 86.7 acres south and north of the proposed Gulf jetties will be for the purpose of beach nourishment (and includes 55.2 acres of shallow Gulf waters). Sandy maintenance material will be placed on the beach on either the north or south side of the jetties. No other impacts are expected on photosynthesis, or suspension/filter feeders, except for temporary impacts from placement operations, which will increase the local turbidity levels. The City of Corpus Christi, responsible to the GLO and the School Land Board, will work through the CBBEP to perform mitigation on Shamrock Island. The plan will include protecting Shamrock Island and enhancing it through habitat establishment of SAV (16.2 acres), high salt marsh (17.6 acres), low salt marsh (0.4 acres), and tidal flats (1.9 acres). See Section 4.15 in this FEIS for further description of the mitigation plan.

Proposed secondary development for public/park facilities by the City of Corpus Christi will impact an additional 0.3 acre of tidal flats, 3.7 acres of dunes, and 3.8 acres of beach. This is a separate action by the City of Corpus Christi.

(4) Actions Taken to Minimize Impacts

During sand placement on the beach, small retaining dikes along the landward and seaward sides may be used to contain material. Also, best management practices (BMPs), such as sand fences, may be installed to offset potential erosion. During placement of dredged material, particularly fine-grained material into PA 1, it may be necessary to increase the ponding in the area to allow the fines to settle. The discharge effluent from this placement area will be controlled to achieve acceptable levels of total suspended solids (daily samples taken when effluent is most turbid). Contract specifications will require the contractor to monitor effluent quality and ensure that dredging operations will not result in TSS levels that exceed 300 milligrams per liter.

d. Contaminant Determinations

No increase in contaminant levels is expected during construction and placement operations. The potential for contaminants has been evaluated through chemical analyses, and grain-size analyses. Sandy material will be used beneficially on the beach, and silty material will go into confined upland PAs.

e. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton

Construction and placement operations are expected to have only minor temporary, local impacts on plankton due to increased turbidity levels.

(2) Effects on Benthos

Project dredging and placement operations will potentially bury 55.2 acres (shallow Gulf waters) of benthos in PA 4S. Approximately 31.5 acres placement on the beach is proposed in PA 4. However, except for those lost during construction dredging, there will be recovery. Benthic organisms can migrate upward through placed material, if it is not too thick and, except for those areas such as part of PAs 1–3 that become uplands, recolonization will occur.

(3) Effects on Nekton

Opening the channel will provide additional water column for use by nekton. Turbidities associated with dredging operations may affect some aquatic organisms locally near the active dredges and outflow weirs, however, no significant impact on nekton populations is anticipated from the construction/maintenance dredging and placement operations. The proposed new channel area represents a small increase in habitat for those nekton species common in deeper offshore waters, which periodically invade the bay through the deep channel corridor (Breuer, 1962). Creating a new channel would also result in a small increased feeding and nursery area for demersal fish (Breuer, 1972) (FEIS Section 4.5.1). Changes in salinity would have beneficial but insignificant impacts on fisheries in the Laguna Madre.

(4) Effects on Aquatic Food Web

There will be minor temporary impacts to the food web from the turbidity associated with construction and maintenance dredging.

(5) Effects on Special Aquatic Sites

There are no coral reefs or riffle and pool complexes in the project area. Approximately 1.9 acres of tidal flats will be impacted in addition to 5.4 acres of submerged aquatic vegetation and 17.8 acres of high and low salt marsh (includes only 0.2 acre of low salt marsh). The City of Corpus Christi will work through the CCBEP to perform the required mitigation under the responsibility of the GLO and School Land Board. Potential secondary development impacts proposed by the City of Corpus Christi for recreational development may negatively affect another 0.3 acre of tidal flats. These impacts are not considered part of the Project.

(6) Threatened and Endangered Species

There are no Federally listed threatened or endangered aquatic species occurring in the project area. However, critical habitat for the piping plover will be affected by channel and jetty construction (1.5 acres) and beach nourishment, a temporary impact (20.0 acres). The mitigation plan will allow for creation of SAV, tidal flats, and low and high salt marsh habitat.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination

Testing has demonstrated that adequate mixing exists to dilute the concentrations of effluents from the UCPAs.

(2) Determination of Compliance With Applicable Water Quality Standards

Sediment analyses of new work material have been performed and testing of elutriates prepared with maintenance material has not demonstrated any violation of applicable water quality standards. The State of Texas has granted a water quality certification for previous maintenance dredging of Packery Channel, indicating that water quality standards are being met.

(3) Potential Effects on Human Use Characteristics

(a) Municipal and Private Water Supply

The proposed project will not impact any municipal or private water supplies.

(b) Recreational and Commercial Fisheries

Recreational and commercial fishing in the Laguna Madre may also be enhanced as a result of the minor salinity changes that are expected (FEIS Section 4.5.1.1). Recreational opportunities will increase with the construction of the channel extension.

(c) Water-Related Recreation

The project will allow access to the Gulf for local recreational fishermen. Passes and jetties, e.g., those at Port Mansfield, are normally heavily fished. Any improvement to fisheries from the expected minor salinity changes will benefit local recreational fishermen. An increase in boat traffic, however, may be a detriment to fishermen currently using the existing channel. Beach nourishment will provide a beach south of the channel for use by local residents and visitors to the area. The beach front will be cut by the channel limiting the ability of persons to use that portion of the beach; however, access to both sides of the channel will be provided. Amenities proposed by the City of Corpus Christi as a separate action should provide more parking for patrons interested in using the beach and the channel.

(d) Aesthetics

The project is designed to minimize any adverse impacts to the environment and aesthetic qualities in the area, although during construction of the channel and sand placement on the beach, access will be restricted.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

The Mollie Beattie Habitat Community (MBHC), a State-Federal cooperative preserve on State-owned land, is located in the immediate area of the proposed project. West of the SH 361 bridge the existing channel passes through the southern portion of the MBHC, where the MBHC property boundary (State Tract 60) extends south to the shoreline. MBHC covers approximately 1,000 acres of high and low salt marshes, seagrass beds, coastal prairies, and tidal flats which serve as valuable habitat for a variety of shorebirds (including the threatened piping plover (*Charadrius melodius*)), wadingbirds, and other species.

Potential direct impacts of the proposed project to the MBHC are associated with dredging along Reach 2 and include increased turbidity in adjacent waters and noise from equipment and humans disturbing local wildlife. These negative impacts are considered temporary and will not result in significant long-term impacts. Maintenance dredging along this reach will occur approximately once every 5 years; thus, exposure to the dredging activities will be limited.

Secondary impacts associated with the project may include an increase of public use at the MBHC, resulting in an increase in vehicle traffic, including watercraft. A proposed no-wake zone will be enforced in this area, thus reducing potential for shoreline erosion.

A Memorandum of Understanding (MOU) has been signed by the GLO and the non-Federal sponsor to provide a mechanism to monitor any secondary effects that the project may have on the MBHC, enforce the no-wake zone, determine any mitigation measures that may be needed, and establish procedures for implementing the mitigation measures. The MOU is presented in Appendix A of this FEIS.

g. Determination of Cumulative Effects on the Aquatic Ecosystem

The project is expected to result in net benefits to the human environment without adding to negative cumulative impacts in the aquatic ecosystem.

h. Determination of Secondary Effects on the Aquatic Ecosystem

No significant secondary effects on the aquatic ecosystem should occur as a result of the recommended project. Secondary development, including an increase in recreational boating, may potentially increase the potential for oil leaks, though the likelihood is small so the effects would be considered minor.

**FINDINGS OF COMPLIANCE WITH
SECTION 404(b)(1) GUIDELINES
FOR
THE NORTH PADRE ISLAND STORM DAMAGE REDUCTION
AND ENVIRONMENTAL RESTORATION PROJECT
NUECES COUNTY, TEXAS**

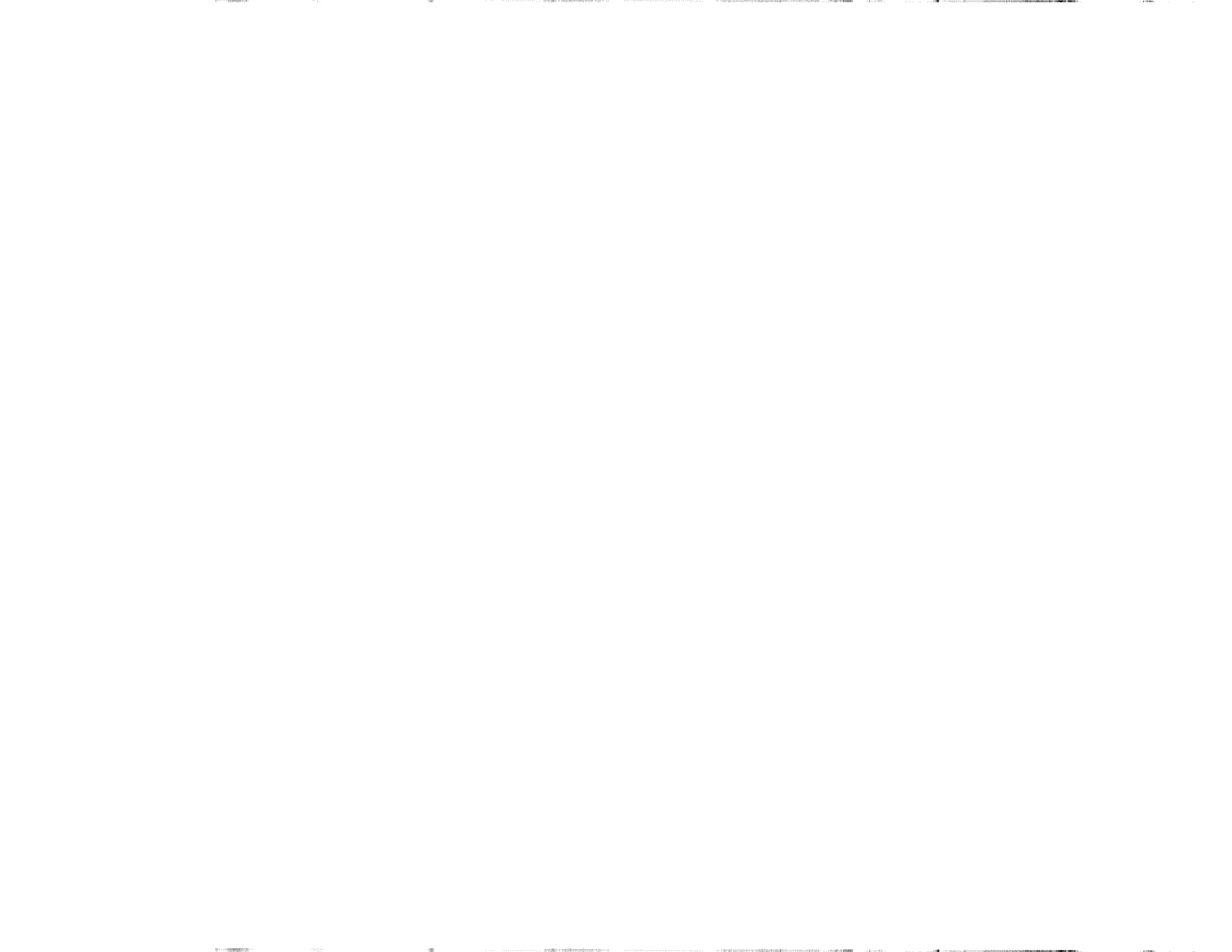
1. No significant adaptations of the Guidelines were made relative to the evaluation for this project.
2. The recommended plan is the result of evaluation of the proposed dredging and extension of Packery Channel and the No-Action alternative.
3. The recommended plan will not violate any applicable State or Federal water quality criteria or toxic effluent standards of Section 307 of the Clean Water Act.
4. The recommended plan will not jeopardize the continued existence of any State or Federally listed threatened or endangered species. Critical habitat for the piping plover will be removed due to the proposed construction of the channel; however, a non-jeopardy Biological Opinion has been issued by the FWS for this project.
5. The recommended plan will not result in adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. There are no significant adverse impacts expected for the estuarine ecosystem diversity, productivity and stability, or recreational, aesthetic, and economic values.
6. Appropriate steps to minimize potential adverse impacts on the estuarine system include coordination with State and Federal resource agencies during final design prior to construction to incorporate all valid suggestions. Impacts to submerged aquatic vegetation and special aquatic sites affected by channel widening, deepening, and expansion will be mitigated.
7. Based on the guidelines, the preferred alternative is specified as complying with the requirements of the Section 404(b)(1) guidelines.

Date

Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental, and
Regulatory Division

APPENDIX E

HABITAT EVALUATION PROCEDURE (HEP) EVALUATION



APPENDIX E HEP Evaluation

Prepared by Edmund L. Oborny, Jr., Bio-West, Inc.
and Ka Leung Lee, Ph.D., PBS&J

INTRODUCTION

The purpose of this analysis was to quantify the environmental effects to fish and wildlife resources via the Packery Channel Alternative described in Section 2.0. As with for the Packery Channel PSP (USACE, 1999, discussed in Section 1.0 of the Draft EIS), the evaluation of aquatic organism effects was performed by conducting Habitat Evaluation Procedures (HEP) analysis for select aquatic species.

METHODS

The species for the present analysis were selected to be consistent with USACE (1999). For the PSP, a detailed review of the TPWD fisheries data was conducted along with meetings with key personnel from the resource agencies and academia. The main criteria for selection were having a fully developed Habitat Suitability Index (HSI) model and model parameters that were consistent with the study area. Five species, including *Penaeus aztecus* (brown shrimp), *Cynoscion nebulosus* (spotted seatrout), *Scianops ocellatus* (red drum), *Paralichthys lethostigma* (southern flounder), and *Paralichthys albigutta* (Gulf flounder) were selected for HEP analysis.

The FWS documentation for the HSI models for these five species are as follows:

TITLE	REFERENCE	DATE
Northern Gulf of Mexico Brown and White Shrimp	FWS/OBS-82/10.54	September 1983
Spotted Seatrout	FWS/OBS-82/10.75	September 1984
Larval and Juvenile Red Drum	FWS/OBS-82/10.74	September 1984
Southern and Gulf Flounder	Biological Report 82 (10.92)	June 1985

The essential components of each of the above models are water quality, food and cover. Table E-1 provides a description of the model parameters for each species. Although these species were agreed upon for the PSP, some limitations to the HSI models are present. The most notable limitation is that open bay bottom habitat is not considered in the HSI model for brown shrimp. Therefore, the Corpus Christi Bay area was not evaluated using the brown shrimp HSI model. A second limitation for the brown shrimp model is that the optimal HSI value listed for salinity is between 10–20 parts per thousand (ppt) which is considerably lower than existing conditions in the study area. However, the main reason to include brown shrimp is to provide a comparison to the earlier work conducted by Nueces County, by the FWS, and the PSP. Additionally, all water quality measurements associated with the HSI model for both the southern and Gulf flounder should be taken from within 15 inches of the bottom. The TPWD Resource Monitoring Data for water quality profiles were reviewed and it was determined that only slight differences occurred between the surface and bottom.

Therefore, all salinity values were utilized for HSI analysis. The small vertical differences in water quality in the project area are most likely due to the shallow depth of the project area.

WATER QUALITY

The water quality parameters needed for HSI analysis include salinity, temperature and dissolved oxygen (DO). The baseline salinity conditions were established using the data set (1958-1993) that Ward and Armstrong (1997) compiled for the CCBNEP program (CCBNEP-13), supplemented with the 1994-1997 TPWD Resource Monitoring Program data.

The five species selected require calculation of five different salinity regimes for HSI determination. These regimes are as follows for the respective species:

SALINITY (PPT)	SPECIES
Mean salinity throughout the year	Southern and Gulf Flounder
Minimum monthly mean salinity during winter and spring (December - May)	Spotted Seatrout
Maximum monthly mean salinity over the year	Spotted Seatrout
Mean salinity during the spring (January - May)	Brown Shrimp
Mean salinity during period of larval development (September - November)	Red Drum

To evaluate the effects of the Packery Channel inlet on salinity, two salinity values were calculated, one that represents a long-term average (Average Annual), and another to represent a short-term, high salinity event (80th percentile). The long-term average salinity period was determined by using average conditions from the historical database (1958-1997). The 80th percentile value is that for which 80% of the values fall below this concentration; it would theoretically be expected to occur once every 5 years. The same historical period of record was used to calculate the 80th percentile values for each of the five salinity regimes defined above.

As described in Section 4.2.2, the baseline condition for this analysis included any change resulting from modifications to the JFK Causeway. However, the slight changes in salinity expected from modifications to the Causeway were not sufficient to alter HSI values calculated from the historical baseline conditions used for the PSP. Therefore, the historical baseline conditions used for the PSP were used for the present HEP analyses. For both periods, TxBLEND model runs were conducted for the Packery Channel inlet (Section 4.2.1) and the differences with the base (no inlet) condition quantified. The salinity changes were presented as contour intervals. The new salinity values, adjusted to reflect these changes over the project area were used in the HSI models. To do this, the project area was divided into 2-minute latitude sections from Aransas Pass (27°50') to the mouth of Baffin Bay (27°20') using Nautical Chart 11308. Therefore, Corpus Christi Bay was divided into four 2-minute latitude sections (50'-48', 48'-46', 46'-44', and 44'-42') and the Upper Laguna Madre was divided into eleven 2-minute latitude sections (42'-40', 40'-38', ..., 22'-20'). This enabled the averaging of baseline salinity values for each section. A figure with the contours of salinity change

was then laid over the project area figures and average differences per section were recorded. The average difference per section was then subtracted/added from/to the baseline salinity section value. This process of obtaining areal coverage of before and after salinity values is a necessary step for HSI model application.

The temperature and DO baseline information was determined from the 1978-1997 TPWD Resource Monitoring Program data. Unlike salinity, temperature and DO were held constant, because major changes in temperature and DO are not anticipated as a result of the project. Holding these parameters constant provided a means of evaluating effects based solely on changes in salinity.

FOOD AND COVER

Food and cover parameters are also required for an estimation of HSI. For this project, these include emergent wetlands, submerged aquatic vegetation, and substrate composition. The percentage of emergent wetlands was set constant at 5% for both Corpus Christi Bay and the Upper Laguna Madre. The percentage of submerged aquatic vegetation was set at 10% for Corpus Christi Bay and 70% for the Upper Laguna Madre (USACE, 1999). A precise estimate of the percentage of vegetation is not necessary for comparison between alternatives; however, an estimate is necessary to evaluate whether water quality (i.e., salinity) or food and cover is the limiting factor. The substrate composition classification, derived from the actual model development data used for the southern and Gulf flounder model, was set at 34-66% mud or silt with the remainder sand or shell. This substrate classification was utilized across the entire study area. As with temperature and DO, emergent and submerged aquatic vegetation and substrate classification were held constant for the baseline and Packery Channel alternative.

AREA

With the changes in salinity quantified and all other parameters remaining constant, HSI values were calculated for each species for the Packery Channel alternative. However, in order to compute the actual habitat units (HU) for a project, the impacted area must be quantified. The HSI value multiplied by the Area is the final HEP product reported as Average Annual Habitat Units (AAHU). Water surface area and shoreline length calculations were based on the use of the Nueces and Kleberg counties, Bentley Microstation design files created by the Texas Department of Transportation (TxDOT). A 2-minute latitude grid was created using Bentley's GeoCoordinator beginning at 27° 20' north and ending at 27° 52' north. This grid was then used in Bentley's Geographics to clean and build water surface polygons and segment shorelines. The resulting polygons and segmented shorelines were imported into ESRI's ArcView 3.0a in which the water surface areas were calculated.

RESULTS AND DISCUSSIONS

HEP ANALYSIS

As noted above, the HEP analysis requires two main components; HSI values and area of impact. To calculate the HSI values, species-specific parameters are needed for both baseline (without-project) and with-project alternatives. As previously discussed, five species were selected for HEP analysis. The species-specific parameters for these species are described in Table E-1. The calculation of baseline conditions for

these parameters was discussed above. The baseline conditions for these parameters are important since the HSI models only consider the lowest HSI value between the water quality and food/cover components of the model. Therefore, if the food/cover component is not sufficient to support a species and results in a low HSI value, changes in salinity are of no consequence. This is exactly the case for red drum in which the food/cover component drives the model because of the limited amount of emergent vegetation. Therefore, the baseline condition and Packery Channel alternative for red drum will produce the same number of habitat units regardless of changes in salinity. For that reason, red drum will not be discussed further. Alternatively, when a parameter falls within the optimal range for both the baseline and Packery Channel alternative, the HSI value is 1 in all instances and no further examination of that parameter is needed. This is the case for both water temperature and DO, as well as minimum monthly mean salinity during the winter and spring for spotted seatrout; therefore all of these parameters were removed from the evaluation.

The remaining parameters include three salinity scenarios (mean salinity throughout the year, maximum monthly mean salinity over the year, and mean salinity during the spring), submerged aquatic vegetation, and substrate composition. The baseline salinity conditions for the three scenarios are presented in Table E-2 with respect to the 2-minute latitude sections and both time periods (Average Annual and 80th percentile). Figure B-1 graphically depicts the conditions. A salinity gradient across the Upper Laguna Madre is evident with fairly similar conditions in Corpus Christi Bay for all scenarios and time periods. The approximate yearly mean for average-annual conditions at the mouth of the Packery Channel alternative is 31 ppt. The Gulf salinity used for the TxBLEND model remained constant at 34 ppt. In fact, considering the historical database for the entire study area used for this project from the mouth of Baffin Bay to Aransas Pass (1958-1997), the Gulf salinity is only exceeded 29% of the time (21% in Corpus Christi Bay and 49% in the Upper Laguna Madre). The 80th percentile values are obviously higher for all three scenarios but exhibit a similar gradient in Corpus Christi Bay and the Upper Laguna Madre (Figure B-1).

The salinity changes predicted by the TxBLEND model for the Packery Channel alternative are presented in Table E-3. A negative value in Table E-3 represents an average salinity decrease while a positive value represents an average salinity increase for each segment. Table E-3 demonstrates that salinity increases are predicted in the study area using the yearly and spring means for average annual conditions. Salinity reductions are predicted for the Packery Channel alternative using the maximum means for average annual conditions and all 80th percentile conditions.

The HSI values (baseline and Packery Channel) for brown shrimp, spotted seatrout, southern flounder and Gulf flounder are presented in Table E-4. Red drum HSI values were not included due to the food/cover limitation, noted above. Also, as previously discussed, no HSI values were calculated in Corpus Christi Bay for brown shrimp due to the model limitation concerning open bay bottom habitat. The HSI values for spotted seatrout in Corpus Christi Bay are limited by the food/cover parameter (10% SAV) and thus comparisons for spotted seatrout in Corpus Christi Bay with respect to salinity changes are also not possible. The HSI calculation for both southern and Gulf flounders involves the addition of the water quality and food/cover component as opposed to the selection for the lowest value (i.e., either water quality or food and cover) as used for the other species' HSI models. Therefore, salinity changes in Corpus Christi Bay can be assessed with respect to expected impact on habitat for southern and Gulf flounders. The acreage for each 2-minute latitude segment is also presented in Table E-4.

As noted above, Average Annual Habitat Units (AAHU) are calculated by multiplying the HSI value by the acreage. The acreage of the impacted area for the Packery Channel alternative was calculated and multiplied by both the baseline HSI value and the Packery Channel HSI value. The AAHUs for the baseline and Packery Channel alternative are presented in Table E-5. The final product for this HEP analysis is a comparison of the baseline AAHU versus the Packery Channel alternative AAHU to determine the net change. The net changes are presented in Table E-6 and summarized below.

NET CHANGES IN AVERAGE ANNUAL HABITAT UNITS

	Annual Average Conditions	80th Percentile
Gulf Flounder	-132	246
Southern Flounder	-371	218
Spotted Seatrout	368	6040
Brown Shrimp	-7	464

For average annual conditions, Gulf and southern flounder and brown shrimp all showed slight negative changes in AAHU. This is because of the increase in salinity that was predicted for the yearly and spring mean scenarios under average annual conditions. The increasing salinities lowered the HSI values for these species and ultimately lowered the AAHU. The spotted seatrout was the only species that showed habitat gains under average annual conditions. The reason for the habitat gains is that salinity reductions were predicted using the maximum monthly mean scenario for average annual conditions.

All species demonstrated habitat gains with respect to the 80th percentile conditions. As previously mentioned, the 80th percentile scenario is reflective of what would theoretically occur once every five years. The increased habitat for the spotted seatrout reflects the steep linear function present in the HSI model, where reductions in salinity from 45 ppt to 37.5 ppt make large differences in HSI values (0 to 1, respectively).

An examination was conducted to better describe what the number of AAHU's gained or lost means with respect to the entire study area. For this assessment, only the average annual conditions were considered. The 80th percentile values provide a glimpse at "worst case" conditions but can not be scaled back to represent average conditions. Furthermore, the average annual conditions for the HEP analysis takes into account "best" and "worst" case conditions. Therefore, all further discussion of environmental benefits will focus on average annual conditions with respect to the HEP analysis. The table below presents the net change in AAHU, reported as a percentage of available AAHU for the study area.

NET PERCENTILE CHANGE IN AAHU

	Annual Average Conditions
Gulf Flounder	-0.11%
Southern Flounder	-0.34%
Spotted Seatrout	0.60%
Brown Shrimp	-0.02%

For example, the net change in AAHU for spotted seatrout under average annual conditions was 368 AAHU (Table E-6). The net change (368) divided by the available AAHU for the Study Area (61,717 AAHU, which equals the sum of baseline AAHU for the same conditions from Table E-5) results in a 0.60% value. Brown shrimp, and southern and Gulf flounder all show very slight negative percentages of overall habitat loss. The spotted seatrout shows a minuscule positive gain (0.6%) in habitat for the Packery Channel alternative.

SUMMARY

The HEP analyses conducted for the Packery Channel alternative supports the earlier studies conducted by FWS, Nueces County, and for the PSP by showing that habitat units for modeled species would be gained under periods of high salinity. Of the five species selected for HSI evaluation, the red drum was eliminated, *a priori*, because of food and cover limitations. Under average annual conditions, all species, except for spotted seatrout, lost habitat. This reflected the lower yearly and spring mean salinity scenarios. Only the spotted seatrout, which utilized the maximum monthly mean salinity scenario, showed slight increases in habitat units with the opening of a channel to the Gulf. Therefore, based on the HEP analysis focusing on changes in salinity, the conclusion is that under average annual conditions very little environmental effect (positive or negative) would result from the Packery Channel alternative.

The increase in shoreline acreage and ease of migration issues were not quantified in this evaluation. For the PSP, it was determined by the resource agencies that a quantification of fish and wildlife resources impacts due to changes in tidal amplitude was not feasible. The literature and experts interviewed seem to agree that an opening to the Gulf would aid the ingress and egress of aquatic organisms. An opening would also provide an escape route during extreme weather conditions.

TABLE E-1

HEP Species - Model Criteria

SPECIES	MODELS	CRITERIA	DESCRIPTION
Brown shrimp (postlarval and juvenile)		Water Quality	Mean salinity during spring Mean water temperature during spring
		Food & Cover	Percentage of estuary covered by vegetation (marsh and seagrass) Substrate composition
Spotted seatrout		Water Quality	Lowest monthly mean winter and spring salinity Highest monthly mean summer salinity Lowest monthly mean winter water temperature Highest monthly mean summer water temperature
		Food & Cover	Percentage of study area with submerged and emergent vegetation, submerged islands, shell reefs, and oyster beds
Red drum (larval and juvenile)	Vegetated	Water Quality	Average water temperature during larval development Average salinity during larval development
		Food & Cover	Percentage of intertidal wetlands Percentage of submerged vegetation
	Non-vegetated	Water Quality	Average water temperature during larval development Average salinity during larval development
		Food & Cover	Percentage of intertidal wetlands Substrate composition Mean depth
Southern flounder		Water Quality	Average annual salinity 10 to 15 cm above the bottom Average temperature 10 to 15 cm above the bottom, May to August Average minimum dissolved oxygen concentration 10 to 15 cm above the bottom, May to August
		Cover	Substrate composition
Gulf flounder		Water Quality	Average annual salinity 10 to 15 cm above the bottom Average temperature 10 to 15 cm above the bottom, May to August Average minimum dissolved oxygen concentration 10 to 15 cm above the bottom, May to August
		Cover	Substrate composition

TABLE E-2

Baseline Salinity Conditions over Project Area

Latitude (Minutes)	SALINITY (ppt)					
	Average Annual Conditions			80th Percentile		
	Yearly Mean ¹	Maximum Mean ²	Spring Mean ³	Yearly Mean ¹	Maximum Mean ²	Spring Mean ³
20-22	36.92	39.82	35.90	46.04	49.40	45.06
22-24	37.71	45.41	35.84	45.50	52.90	44.78
24-26	37.21	43.38	35.14	44.08	49.82	41.96
26-28	36.90	41.32	34.70	43.80	49.70	40.50
28-30	35.55	39.31	33.67	42.08	48.16	39.40
30-32	36.04	41.21	33.65	43.00	50.10	39.16
32-34	34.40	37.83	31.93	41.10	45.70	36.10
34-36	33.66	38.08	33.05	40.50	50.04	38.90
36-38	31.83	36.66	30.45	37.80	42.60	35.00
38-40	30.74	34.88	29.39	36.60	41.44	34.40
40-42	29.45	34.75	28.39	35.50	41.00	33.30
42-44	29.01	33.26	28.02	34.76	39.00	32.20
44-46	29.24	32.94	29.21	34.00	37.86	32.80
46-48	28.94	32.48	29.08	34.10	37.08	32.82
48-50	28.96	33.60	28.04	33.90	37.40	31.70

¹ Mean salinity for the year using the 1958-1997 database.

² Maximum monthly mean salinity for the year using the 1958-1997 database.

³ Mean spring salinity (January to May) for the year using the 1958-1997 database.

TABLE E-3

Predicted Salinity Changes

AVERAGE ANNUAL CONDITIONS				80th PERCENTILE			
Latitude (minute range)	BASELINE SALINITY (ppt)	AREA (acres)	PACKERY CHANNEL Salinity Change (ppt)	Latitude (minute range)	BASELINE SALINITY (ppt)	AREA (acres)	PACKERY CHANNEL Salinity Change (ppt)
YEARLY MEAN				YEARLY MEAN			
50-52	28.96	10642	0.00	50-52	33.90	10642	0.00
48-50	28.96	22633	0.00	48-50	33.90	22633	0.00
46-48	28.94	23818	0.25	46-48	34.10	23818	0.00
44-46	29.24	19557	0.50	44-46	34.00	19557	0.00
42-44	29.01	14235	0.50	42-44	34.76	14235	0.00
40-42	29.45	7219	0.75	40-42	35.50	7219	-0.50
38-40	30.74	7453	1.50	38-40	36.60	7453	-1.25
36-38	31.83	5074	1.25	36-38	37.80	5074	-1.00
34-36	33.66	5072	1.00	34-36	40.50	5072	-1.00
32-34	34.40	5742	1.00	32-34	41.10	5742	-0.50
30-32	36.04	5075	1.00	30-32	43.00	5075	-0.50
28-30	35.55	4251	0.50	28-30	42.08	4251	0.00
26-28	36.90	3712	0.50	26-28	43.80	3712	0.00
24-26	37.21	3387	0.00	24-26	44.08	3387	0.00
22-24	37.71	2961	0.00	22-24	45.50	2961	0.00
20-22	36.92	2395	0.00	20-22	46.04	2395	0.00
MAXIMUM MEAN				MAXIMUM MEAN			
50-52	33.60	10642	0.00	50-52	37.40	10642	-0.50
48-50	33.60	22633	0.00	48-50	37.40	22633	-0.50
46-48	32.48	23818	0.00	46-48	37.08	23818	-0.50
44-46	32.94	19557	0.00	44-46	37.86	19557	-0.75
42-44	33.26	14235	0.00	42-44	39.00	14235	-1.00
40-42	34.75	7219	-0.50	40-42	41.00	7219	-1.25
38-40	34.88	7453	-1.25	38-40	41.44	7453	-2.75
36-38	36.66	5074	-1.00	36-38	42.60	5074	-2.25
34-36	38.08	5072	-1.00	34-36	50.04	5072	-2.25
32-34	37.83	5742	-0.50	32-34	45.70	5742	-2.00
30-32	41.21	5075	-0.50	30-32	50.10	5075	-1.50
28-30	39.31	4251	0.00	28-30	48.16	4251	-1.25
26-28	41.32	3712	0.00	26-28	49.70	3712	-0.50
24-26	43.38	3387	0.00	24-26	49.82	3387	-0.25
22-24	45.41	2961	0.00	22-24	52.90	2961	0.00
20-22	39.82	2395	0.00	20-22	49.40	2395	0.00
SPRING MEAN				SPRING MEAN			
50-52	28.04	10642	0.00	50-52	31.70	10642	0.00
48-50	28.04	22633	0.00	48-50	31.70	22633	0.00
46-48	29.08	23818	0.25	46-48	32.82	23818	0.00
44-46	29.21	19557	0.50	44-46	32.80	19557	0.00
42-44	28.02	14235	0.50	42-44	32.20	14235	0.00
40-42	28.39	7219	0.75	40-42	33.30	7219	-0.50
38-40	29.39	7453	1.50	38-40	34.40	7453	-1.25
36-38	30.45	5074	1.25	36-38	35.00	5074	-1.00
34-36	33.05	5072	1.00	34-36	38.90	5072	-1.00
32-34	31.93	5742	1.00	32-34	36.10	5742	-0.50
30-32	33.65	5075	1.00	30-32	39.16	5075	-0.50
28-30	33.67	4251	0.50	28-30	39.40	4251	0.00
26-28	34.70	3712	0.50	26-28	40.50	3712	0.00
24-26	35.14	3387	0.00	24-26	41.96	3387	0.00
22-24	35.84	2961	0.00	22-24	44.78	2961	0.00
20-22	35.90	2395	0.00	20-22	45.06	2395	0.00

TABLE E-4

HSI Values

AVERAGE ANNUAL CONDITIONS				80th PERCENTILE			
Latitude (minute range)	BASELINE HSI	AREA (acres)	Packery Channel HSI value	Latitude (minute range)	BASELINE HSI	AREA (acres)	Packery Channel HSI value
YEARLY MEAN - GULF FLOUNDER				YEARLY MEAN - GULF FLOUNDER			
50-52	0.837	10642	0.837	50-52	0.837	10642	0.837
48-50	0.837	22633	0.837	48-50	0.837	22633	0.837
46-48	0.837	23818	0.837	46-48	0.837	23818	0.837
44-46	0.837	19557	0.837	44-46	0.837	19557	0.837
42-44	0.837	14235	0.837	42-44	0.837	14235	0.837
40-42	0.837	7219	0.837	40-42	0.832	7219	0.837
38-40	0.837	7453	0.837	38-40	0.824	7453	0.832
36-38	0.837	5074	0.837	36-38	0.810	5074	0.819
34-36	0.837	5072	0.832	34-36	0.786	5072	0.796
32-34	0.837	5742	0.832	32-34	0.781	5742	0.786
30-32	0.828	5075	0.819	30-32	0.760	5075	0.765
28-30	0.832	4251	0.828	28-30	0.771	4251	0.771
26-28	0.819	3712	0.815	26-28	0.748	3712	0.748
24-26	0.819	3387	0.819	24-26	0.748	3387	0.748
22-24	0.815	2961	0.815	22-24	0.730	2961	0.730
20-22	0.819	2395	0.819	20-22	0.724	2395	0.724
YEARLY MEAN - SOUTHERN FLOUNDER				YEARLY MEAN - SOUTHERN FLOUNDER			
50-52	0.785	10642	0.785	50-52	0.751	10642	0.751
48-50	0.785	22633	0.785	48-50	0.751	22633	0.751
46-48	0.785	23818	0.785	46-48	0.751	23818	0.751
44-46	0.785	19557	0.782	44-46	0.751	19557	0.751
42-44	0.785	14235	0.782	42-44	0.744	14235	0.744
40-42	0.782	7219	0.779	40-42	0.740	7219	0.744
38-40	0.775	7453	0.765	38-40	0.732	7453	0.740
36-38	0.765	5074	0.758	36-38	0.721	5074	0.729
34-36	0.755	5072	0.748	34-36	0.699	5072	0.708
32-34	0.748	5742	0.744	32-34	0.695	5742	0.699
30-32	0.736	5075	0.729	30-32	0.676	5075	0.680
28-30	0.740	4251	0.736	28-30	0.685	4251	0.685
26-28	0.729	3712	0.729	26-28	0.665	3712	0.665
24-26	0.729	3387	0.721	24-26	0.665	3387	0.665
22-24	0.725	2961	0.725	22-24	0.649	2961	0.649
20-22	0.729	2395	0.729	20-22	0.644	2395	0.644
MAXIMUM MEAN - SPOTTED SEATROUT				MAXIMUM MEAN - SPOTTED SEATROUT			
50-52	0.200	10642	0.200	50-52	0.200	10642	0.200
48-50	0.200	22633	0.200	48-50	0.200	22633	0.200
46-48	0.200	23818	0.200	46-48	0.200	23818	0.200
44-46	0.200	19557	0.200	44-46	0.200	19557	0.200
42-44	0.200	14235	0.200	42-44	0.200	14235	0.200
40-42	1.000	7219	1.000	40-42	0.730	7219	0.816
38-40	1.000	7453	1.000	38-40	0.683	7453	0.931
36-38	1.000	5074	1.000	36-38	0.577	5074	0.775
34-36	0.966	5072	1.000	34-36	0.000	5072	0.000
32-34	0.966	5742	1.000	32-34	0.000	5742	0.447
30-32	0.730	5075	0.730	30-32	0.000	5075	0.000
28-30	0.856	4251	0.856	28-30	0.000	4251	0.000
26-28	0.683	3712	0.683	26-28	0.000	3712	0.000
24-26	0.447	3387	0.447	24-26	0.000	3387	0.000
22-24	0.000	2961	0.000	22-24	0.000	2961	0.000
20-22	0.816	2395	0.816	20-22	0.000	2395	0.000
SPRING MEAN - BROWN SHRIMP				SPRING MEAN - BROWN SHRIMP			
50-52	NA	10642	NA	50-52	NA	10642	NA
48-50	NA	22633	NA	48-50	NA	22633	NA
46-48	NA	23818	NA	46-48	NA	23818	NA
44-46	NA	19557	NA	44-46	NA	19557	NA
42-44	NA	14235	NA	42-44	NA	14235	NA
40-42	0.732	7219	0.732	40-42	0.732	7219	0.732
38-40	0.732	7453	0.732	38-40	0.732	7453	0.732
36-38	0.732	5074	0.732	36-38	0.730	5074	0.732
34-36	0.732	5072	0.732	34-36	0.566	5072	0.611
32-34	0.732	5742	0.732	32-34	0.693	5742	0.712
30-32	0.732	5075	0.732	30-32	0.566	5075	0.589
28-30	0.732	4251	0.732	28-30	0.542	4251	0.542
26-28	0.732	3712	0.730	26-28	0.490	3712	0.490
24-26	0.730	3387	0.730	24-26	0.400	3387	0.400
22-24	0.693	2961	0.693	22-24	0.000	2961	0.000
20-22	0.693	2395	0.693	20-22	0.000	2395	0.000

TABLE E-5

Average Annual Habitat Units (AAHU)

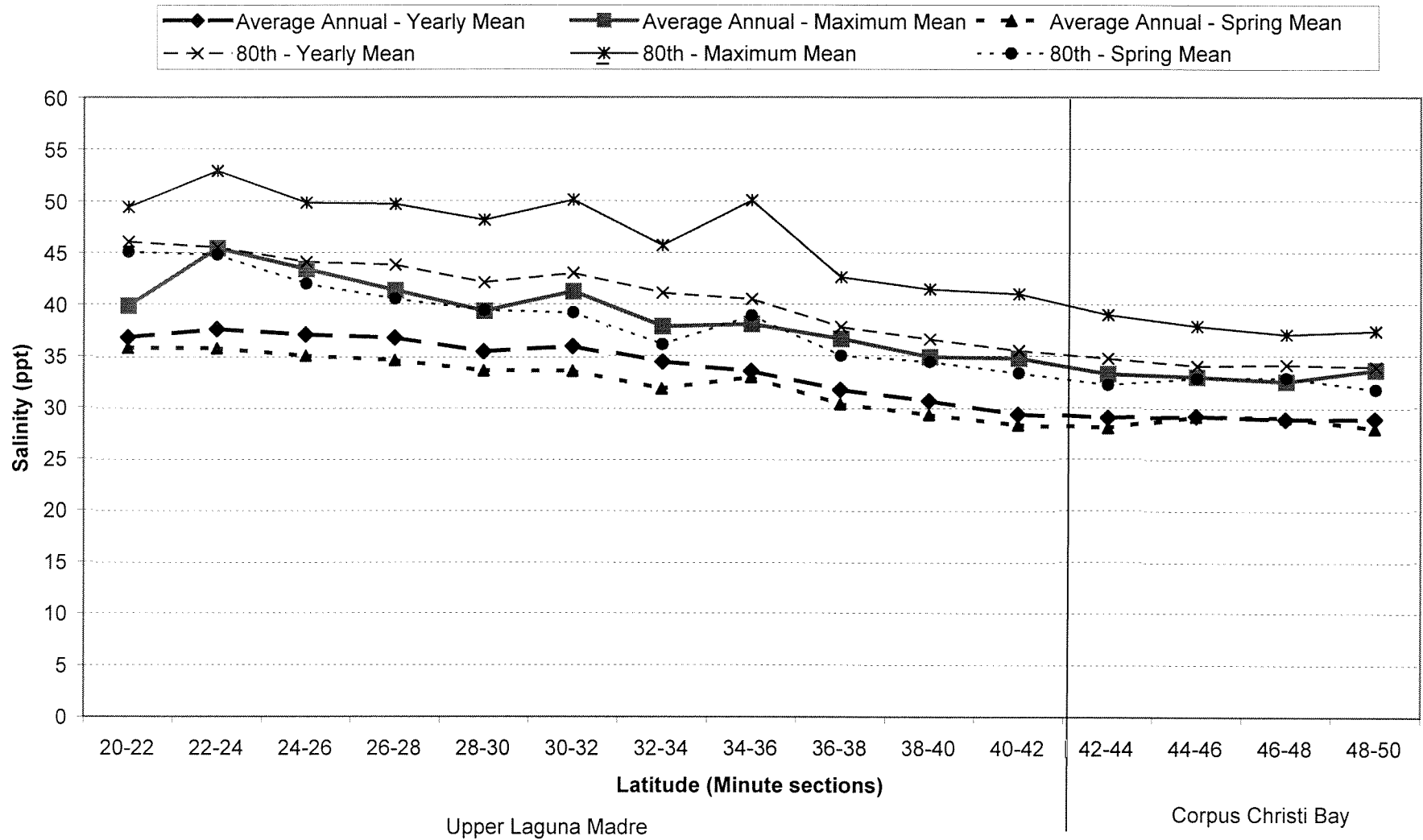
AVERAGE ANNUAL CONDITIONS					80th PERCENTILE				
Latitude (minute range)	HSI	BASELINE AREA (acres)	AAHU	Packery Channel AAHU	Latitude (minute range)	HSI	BASELINE AREA (acres)	AAHU	Packery Channel AAHU
YEARLY MEAN - GULF FLOUNDER					YEARLY MEAN - GULF FLOUNDER				
50-52	0.837	10642	8907	8907	50-52	0.837	10642	8907	8907
48-50	0.837	22633	18944	18944	48-50	0.837	22633	18944	18944
46-48	0.837	23818	19935	19935	46-48	0.837	23818	19935	19935
44-46	0.837	19557	16369	16369	44-46	0.837	19557	16369	16369
42-44	0.837	14235	11915	11915	42-44	0.837	14235	11915	11915
40-42	0.837	7219	6042	6042	40-42	0.832	7219	6006	6042
38-40	0.837	7453	6238	6238	38-40	0.824	7453	6141	6201
36-38	0.837	5074	4247	4247	36-38	0.810	5074	4110	4155
34-36	0.837	5072	4245	4220	34-36	0.786	5072	3987	4037
32-34	0.837	5742	4806	4777	32-34	0.781	5742	4484	4513
30-32	0.828	5075	4202	4157	30-32	0.760	5075	3857	3883
28-30	0.832	4251	3537	3520	28-30	0.771	4251	3278	3278
26-28	0.819	3712	3040	3025	26-28	0.748	3712	2777	2777
24-26	0.819	3387	2774	2774	24-26	0.748	3387	2534	2534
22-24	0.815	2961	2413	2413	22-24	0.730	2961	2162	2162
20-22	0.819	2395	1961	1961	20-22	0.724	2395	1734	1734
YEARLY MEAN - SOUTHERN FLOUNDER					YEARLY MEAN - SOUTHERN FLOUNDER				
50-52	0.785	10642	8354	8354	50-52	0.751	10642	7992	7992
48-50	0.785	22633	17767	17767	48-50	0.751	22633	16998	16998
46-48	0.785	23818	18697	18697	46-48	0.751	23818	17887	17887
44-46	0.785	19557	15352	15293	44-46	0.751	19557	14687	14687
42-44	0.785	14235	11175	11132	42-44	0.744	14235	10591	10591
40-42	0.782	7219	5645	5624	40-42	0.740	7219	5342	5371
38-40	0.775	7453	5776	5702	38-40	0.732	7453	5456	5515
36-38	0.765	5074	3881	3846	36-38	0.721	5074	3658	3699
34-36	0.755	5072	3829	3794	34-36	0.699	5072	3545	3591
32-34	0.748	5742	4295	4272	32-34	0.695	5742	3991	4014
30-32	0.736	5075	3735	3700	30-32	0.676	5075	3431	3451
28-30	0.740	4251	3146	3129	28-30	0.685	4251	2912	2912
26-28	0.729	3712	2706	2706	26-28	0.665	3712	2469	2469
24-26	0.729	3387	2469	2442	24-26	0.665	3387	2253	2253
22-24	0.725	2961	2147	2147	22-24	0.649	2961	1922	1922
20-22	0.729	2395	1746	1746	20-22	0.644	2395	1542	1542
MAXIMUM MEAN - SPOTTED SEATROUT					MAXIMUM MEAN - SPOTTED SEATROUT				
50-52	0.200	10642	2128	2128	50-52	0.200	10642	2128	2128
48-50	0.200	22633	4527	4527	48-50	0.200	22633	4527	4527
46-48	0.200	23818	4764	4764	46-48	0.200	23818	4764	4764
44-46	0.200	19557	3911	3911	44-46	0.200	19557	3911	3911
42-44	0.200	14235	2847	2847	42-44	0.200	14235	2847	2847
40-42	1.000	7219	7219	7219	40-42	0.730	7219	5270	5891
38-40	1.000	7453	7453	7453	38-40	0.683	7453	5090	6939
36-38	1.000	5074	5074	5074	36-38	0.577	5074	2928	3932
34-36	0.966	5072	4900	5072	34-36	0.000	5072	0	0
32-34	0.966	5742	5547	5742	32-34	0.000	5742	0	2567
30-32	0.730	5075	3705	3705	30-32	0.000	5075	0	0
28-30	0.856	4251	3639	3639	28-30	0.000	4251	0	0
26-28	0.683	3712	2535	2535	26-28	0.000	3712	0	0
24-26	0.447	3387	1514	1514	24-26	0.000	3387	0	0
22-24	0.000	2961	0	0	22-24	0.000	2961	0	0
20-22	0.816	2395	1954	1954	20-22	0.000	2395	0	0
SPRING MEAN - BROWN SHRIMP					SPRING MEAN - BROWN SHRIMP				
50-52	NA	10642	NA	NA	50-52	NA	10642	NA	NA
48-50	NA	22633	NA	NA	48-50	NA	22633	NA	NA
46-48	NA	23818	NA	NA	46-48	NA	23818	NA	NA
44-46	NA	19557	NA	NA	44-46	NA	19557	NA	NA
42-44	NA	14235	NA	NA	42-44	NA	14235	NA	NA
40-42	0.732	7219	5284	5284	40-42	0.732	7219	5284	5284
38-40	0.732	7453	5456	5456	38-40	0.732	7453	5456	5456
36-38	0.732	5074	3714	3714	36-38	0.730	5074	3704	3714
34-36	0.732	5072	3713	3713	34-36	0.566	5072	2871	3099
32-34	0.732	5742	4203	4203	32-34	0.693	5742	3979	4088
30-32	0.732	5075	3715	3715	30-32	0.566	5075	2873	2989
28-30	0.732	4251	3112	3112	28-30	0.542	4251	2304	2304
26-28	0.732	3712	2717	2710	26-28	0.490	3712	1819	1819
24-26	0.730	3387	2473	2473	24-26	0.400	3387	1355	1355
22-24	0.693	2961	2052	2052	22-24	0.000	2961	0	0
20-22	0.693	2395	1659	1659	20-22	0.000	2395	0	0

TABLE E-6

Net Changes in Average Annual Habitat Units (AAHU)

	AVERAGE ANNUAL CONDITIONS	80th PERCENTILE	AVERAGE ANNUAL CONDITIONS
Latitude (minute range)	Packery Channel Net Changes (AAHU)	Packery Channel Net Changes (AAHU)	Packery Channel Net Changes (% AAHU)
	YEARLY MEAN - GULF FLOUNDER	YEARLY MEAN - GULF FLOUNDER	YEARLY MEAN - GULF FLOUNDER
50-52	0	0	0.00%
48-50	0	0	0.00%
46-48	0	0	0.00%
44-46	0	0	0.00%
42-44	0	0	0.00%
40-42	0	36	0.00%
38-40	0	60	0.00%
36-38	0	46	0.00%
34-36	-25	51	-0.60%
32-34	-29	29	-0.60%
30-32	-46	25	-1.09%
28-30	-17	0	-0.48%
26-28	-15	0	-0.49%
24-26	0	0	0.00%
22-24	0	0	0.00%
20-22	0	0	0.00%
TOTAL	-132	246	-0.11%
	YEARLY MEAN - SOUTHERN FLOUNDER	YEARLY MEAN - SOUTHERN FLOUNDER	YEARLY MEAN - SOUTHERN FLOUNDER
50-52	0	0	0.00%
48-50	0	0	0.00%
46-48	-59	0	-0.31%
44-46	-43	0	-0.28%
42-44	-22	29	-0.19%
40-42	-75	60	-1.32%
38-40	-36	41	-0.61%
36-38	-36	46	-0.91%
34-36	-23	23	-0.60%
32-34	-36	20	-0.83%
30-32	-17	0	-0.46%
28-30	0	0	0.00%
26-28	-27	0	-1.00%
24-26	0	0	0.00%
22-24	0	0	0.00%
20-22	0	0	0.00%
TOTAL	-371	218	-0.34%
	MAXIMUM MEAN - SPOTTED SEATROUT	MAXIMUM MEAN - SPOTTED SEATROUT	MAXIMUM MEAN - SPOTTED SEATROUT
50-52	0	0	0.00%
48-50	0	0	0.00%
46-48	0	0	0.00%
44-46	0	621	0.00%
42-44	0	1848	0.00%
40-42	0	1005	0.00%
38-40	172	0	2.31%
36-38	195	2567	3.85%
34-36	0	0	0.00%
32-34	0	0	0.00%
30-32	0	0	0.00%
28-30	0	0	0.00%
26-28	0	0	0.00%
24-26	0	0	0.00%
22-24	0	0	0.00%
20-22	0	0	0.00%
TOTAL	368	6040	0.60%
	SPRING MEAN - BROWN SHRIMP	SPRING MEAN - BROWN SHRIMP	SPRING MEAN - BROWN SHRIMP
50-52	N/A	N/A	NA
48-50	N/A	N/A	NA
46-48	0	0	NA
44-46	0	0	NA
42-44	0	10	NA
40-42	0	228	0.00%
38-40	0	109	0.00%
36-38	0	117	0.00%
34-36	0	0	0.00%
32-34	-7	0	-0.18%
30-32	0	0	0.00%
28-30	0	0	0.00%
26-28	0	0	0.00%
24-26	0	0	0.00%
22-24	0	0	0.00%
20-22	0	0	0.00%
TOTAL	-7	464	-0.02%

FIGURE E-1
Baseline Salinity Conditions



APPENDIX F

REVISED BIOLOGICAL ASSESSMENT FOR IMPACTS TO ENDANGERED AND THREATENED SPECIES RELATIVE TO THE NORTH PADRE ISLAND STORM DAMAGE REDUCTION AND ENVIRONMENTAL RESTORATION PROJECT, NUECES COUNTY, TEXAS, AND BIOLOGICAL OPINION

**REVISED BIOLOGICAL ASSESSMENT FOR IMPACTS TO
ENDANGERED AND THREATENED SPECIES
RELATIVE TO THE NORTH PADRE ISLAND
STORM DAMAGE REDUCTION AND
ENVIRONMENTAL RESTORATION PROJECT
NUECES COUNTY, TEXAS**

**U.S. Army Corps of Engineers
Galveston District
2000 Fort Point Road
Galveston, Texas 77550**

January 2003

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1.0 INTRODUCTION

1.1 PURPOSE OF THE REVISED BIOLOGICAL ASSESSMENT

This Revised Biological Assessment (BA) has been prepared for the purpose of fulfilling the U.S. Army Corps of Engineer's (USACE) requirements as outlined under Section 7(c) of the Endangered Species Act (ESA) of 1973 as amended. The proposed Federal action requiring the assessment is the construction of Packery Channel in Nueces County, Texas. The City of Corpus Christi is the project sponsor. Table 1 presents a list of Federally listed species in Nueces County addressed in this BA. For the purposes of this BA, the project area is defined as the construction footprint: the area where the actual dredging and construction will take place including the proposed placement areas. In the Draft Environmental Impact Statement (DEIS), the study area is defined extending from the boundary between the Upper Laguna Madre and Corpus Christi Bay to the north and the intersection of Laguna Madre and Baffin Bay to the south (Figure 1). Only species in the project area in Nueces County are addressed in this BA.

Packery Channel will provide a dredged channel across North Padre Island between the Upper Laguna Madre and the Gulf of Mexico. The channel is located east-southeast of the John F. Kennedy (JFK) Causeway, which crosses the Laguna Madre between the city of Corpus Christi and Padre Island. The proposed project will extend an existing 2.6-mile channel between the Gulf Intracoastal Waterway (GIWW) and State Highway 361 (SH 361) to the Gulf, an additional 0.9 miles. The existing channel is largely the result of the modern dredging of a historically shallow cut between what was the historic Packery Channel pass and Laguna Madre constructed under Department of Army Permit No. 17768. This channel was permitted for a 30- to 50-foot bottom width and a 5-foot depth. To the south and west of the currently proposed project is land that has been modified for recreational, commercial, and residential development as well as undeveloped land. North and west of the proposed channel, the land is relatively undeveloped and includes the Mollie Beattie Habitat Community (MBHC), a State-Federal cooperative preserve on State-owned land. The project area is easily accessible by vehicle or boat from Corpus Christi and is extensively used for recreation. The area of project construction east of SH 361 will occur in part of J.P. Luby Park, a public recreational facility.

The Galveston District of the USACE completed a 905(b) analysis of the potential project, dated 6 November 1998. The 905(b) analysis was authorized by Section 442 of the Water Resources Development Act (WRDA) of 1996 (P.L. 104-303, Sec. 442) and directed by the USACE to determine whether there would be a potential Federal interest in a project for environmental restoration, flood damage reduction, navigation, and/or related purposes in the vicinity of Packery Channel. The analysis recommended that the necessary feasibility-level studies be conducted to characterize the potential benefits in more detail and to identify the most cost-effective project features to realize them.

The USACE produced a Project Study Plan (PSP) in 1999 (USACE, 1999) that included a study of three alternative locations and three different channel widths, under three salinity regimes, to determine the environmental benefits of an opening between the Laguna Madre and the Gulf of Mexico. The study was also to provide information to help the study sponsor assess the likelihood of project

TABLE 1
FEDERALLY ENDANGERED AND THREATENED SPECIES OF POTENTIAL
OCCURRENCE IN THE PACKERY CHANNEL PROJECT AREA
IN NUECES COUNTY, TEXAS¹

Common Name	Scientific Name	Status ²
South Texas ambrosia	<i>Ambrosia cheiranthifolia</i>	E
Slender rush-pea	<i>Hoffmannseggia tenella</i>	E
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	E
Green sea turtle	<i>Chelonia mydas</i>	T
Loggerhead sea turtle	<i>Caretta caretta</i>	T
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	E/CH
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E/CH
Brown pelican	<i>Pelecanus occidentalis</i>	E
Bald eagle	<i>Haliaeetus leucocephalus</i>	T/PDL
Whooping crane	<i>Grus americana</i>	E
Piping plover	<i>Charadrius melodus</i>	T/CH†
Mountain plover	<i>Charadrius montanus</i>	PT
Eskimo curlew	<i>Numenius borealis</i>	E
Ocelot	<i>Leopardus pardalis</i>	E
Jaguarundi	<i>Herpailurus yagouaroundi</i>	E
West Indian manatee	<i>Trichechus manatus</i>	E

¹ According to U.S. Fish & Wildlife Service (FWS, 2000a).

² E Endangered; in danger of extinction.
T Threatened; severely depleted or impacted by man.
PT Proposed for listing as threatened.
T/PDL Currently classified as threatened but proposed for delisting in lower 48 states.
CH Critical Habitat (outside of Texas).
CH† Critical Habitat (inside of Texas).

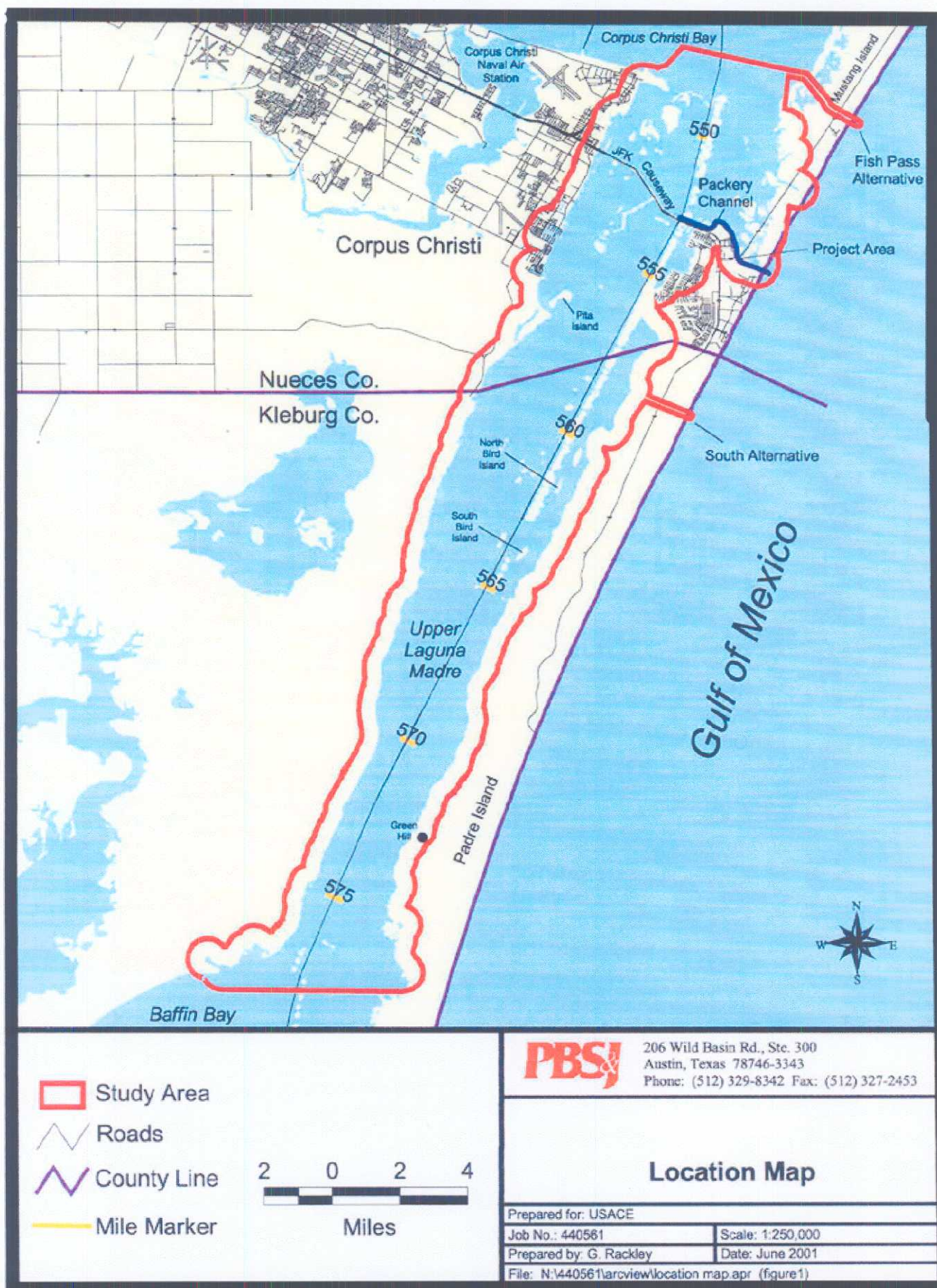


Figure 1

authorization for construction upon conclusion of the Feasibility Study (FS). The analysis showed that a new water-exchange pass would significantly ameliorate high salinity episodes in the Upper Laguna Madre. However, these episodes are relatively rare, occurring on an average of about 1 year in 5; therefore, the potential environmental benefits to marine resources and area wildlife to be achieved by the project would be negligible.

Upon completion of the PSP, the USACE was directed by Congress under the WRDA 1999 CPL 106-53 (Sec. 556 entitled "North Padre Island Storm Damage Reduction and Environmental Restoration Project") to "carry out a project for ecosystem restoration and storm damage reduction at North Padre Island, Corpus Christi, Texas." Because of the magnitude, potential impacts, new compliance requirements, and the political controversy of this project, a Draft EIS was prepared and included a BA (June 14, 2002). The National Marine Fisheries Service (NMFS) concurred that impacts to the marine endangered and threatened species were unlikely and Section 7 consultation was concluded on September 30, 2002. Coordination with the U.S. Fish and Wildlife Service (FWS) has resulted in this revision of the original BA to incorporate additional information on terrestrial endangered and threatened species. This Revised BA reflects the most current project information and coordination available, and incorporates revisions made in response to comments received on the DEIS.

1.2 DESCRIPTION OF THE PROPOSED ACTIONS

The length of the proposed channel from the Gulf end of the jetties to the Gulf Intracoastal Waterway (GIWW) is approximately 18,500 feet (3.5 miles). The Packery Channel alignment follows an existing channel southeast of the GIWW for approximately 2.6 miles to a basin southeast of State Highway 361 (SH 361). From this basin the proposed new channel will extend approximately 0.9 mile toward the Gulf following a historic washover channel (Figure 2). Packery Channel traffic will allow recreational and small commercial boats access between the GIWW and the Gulf. Traffic will not include large commercial ships, tows, deepwater draft barges, or any floating vessel with a draft greater than 4 feet. In addition, the City of Corpus Christi proposes recreational development in association with the construction of the channel. These improvements are considered secondary development impacts and are not part of the Federally cost shared project. A description of this proposed development and footprint is included in the DEIS and has not changed. It should be noted that the development proposed east of SH 361, which is the majority of the development proposed by the City, occurs almost entirely within the Packery Channel project footprint. This development will provide much needed facilities for the existing high public use of J.P. Luby Surf Park, through which Packery Channel will be constructed.

According to the design engineer, URS/Dames & Moore (URS, 2002), the proposed channel opening involves dredging a new channel from the Gulf into the existing basin area (the Inner Basin) located southeast of the SH 361 bridge (Reach 1). Two impermeable rock jetties will extend from the shoreline southeastward approximately 1,400 feet paralleling the channel. The Inner Basin will be widened and deepened. The existing Packery Channel west of SH 361 (Reach 2) that extends to the GIWW will also be widened and deepened.

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Action Area

Figure 2

Five Placement Areas (Figure 2) are proposed for placement of construction and maintenance material from the Project: PAs 1, 2, 3, 4S and N, and MMPA. Approximately 967,500 cubic yards (cy) of new work material will be dredged or excavated and placed in PAs 1 (131,900 cy), 2 (59,300 cy), 3 (26,200 cy), 4S (744,430 cy) and as Dune Fill (5,670 cy). This number includes approximately 50,800 cy of sand excavated from PA 1 to create the capacity for new work material for this PA. The estimated maintenance dredging volume for the 50-year life of the Project is 11,057,500 cy. Maintenance material will be placed in PA 4S and 4N (estimated at 200,000 cy/year) and the MMPA (15,000 cy every 5 years). Windblown sand deposition is also included in the annual dredging estimate. The beach nourishment areas (PAs 4S and 4N), located on the Gulf beach 500 feet south and north of the jetties, respectively, will be used for both new construction and maintenance material of high sand content. A total of 12,025,000 cy of placement area capacity has been identified for the life of the Project including both new work and maintenance material. The proposed MMPA is on property north of the channel near Station 50+00. This PA encompasses approximately 10.5 acres of undeveloped property and is under lease from the Port of Harlingen Authority. A sand bypass system will be utilized to move sand from the areas north and south of the jetties to designated beach areas. Placement areas were established both north and south of the jetties so that either beach could be nourished depending on current erosion conditions. The decision will be made with each dredging cycle concerning which PA will be utilized.

Impacts to endangered species that could result from project construction or maintenance are identified below. All direct construction impacts to coastal vegetative communities have been quantified and a mitigation plan has been developed. In addition, potential indirect project impacts to the MBHC have been addressed by a Memorandum of Understanding (MOU) between the City of Corpus Christi and MBHC resource agencies. The MOU requires monitoring and potential mitigation should project-related impacts be identified. Both the mitigation plan and MOU are incorporated into the General Land Office (GLO) lease to the City of Corpus Christi for project lands.

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2.0 IMPACT ASSESSMENT FOR LISTED SPECIES

To assess the potential impacts of the proposed project on endangered and threatened species, PBS&J personnel (1) conducted a literature review and searched for other scientific data to determine species distributions, habitat needs and other biological requirements; (2) interviewed recognized experts on the listed species, including local and regional authorities and Federal and State wildlife personnel; and (3) conducted an on-site inspection of the biological resources of the project area.

Significant literature sources consulted for this report include the FWS series on endangered species of the seacoast of the U.S. (National Fish and Wildlife Laboratories (NFWL), 1980), Federal status reports and recovery plans, and job reports of the Texas Parks and Wildlife Department (TPWD). A field survey of the project area was performed by PBS&J ecologists on 17 February 1999.

Sixteen threatened and endangered species are potentially present in the project area and are reported below. Potential project impacts and measures to avoid or minimize possible impacts are identified.

2.1 SOUTH TEXAS AMBROSIA

2.1.1 Reasons for Status

South Texas ambrosia (*Ambrosia cheiranthifolia*), also known as South Texas ragweed, was Federally listed as endangered in August 1994 (50 CFR Part 17; 23 September 1994). Primary threats to the survival of this species include a low natural reproductive rate and destruction or disturbance of its habitat (FWS, 1987). Most of the deep clay soils occurring in south Texas that could support habitat for South Texas ambrosia have been converted into agricultural use. Known stands of this species occur in ROWs along highways and railways, where the species is subject to weed-control measures, including mowing and herbicide applications (Turner, 1983). In addition, introduced species such as buffelgrass (*Cenchrus ciliaris*) and King Ranch bluestem (*Bothriochloa ischaemum* var. *songarica*) compete with South Texas ambrosia and other native plants.

2.1.2 Habitat

An erect, silvery to grayish-green, herbaceous perennial 4 to 12 inches tall, South Texas ambrosia is an inhabitant of open, clay loam to sandy loam prairies and savannahs. It occurs in Gulf coastal grasslands dominated by shrubs typical of a local edaphic phase of the Tamaulipan brushland (e.g., species of acacia (*Acacia* spp.), Texas ebony (*Pithecellobium flexicaule*), and cenizo (*Leucophyllum frutescens*)). Grasses typically occurring with South Texas ambrosia include perennials such as bluestems, paspalums (*Paspalum* spp.), and lovegrasses (*Eragrostis* spp.). South Texas ambrosia occurs in flat, deep, largely undisturbed clay soils or occasionally on wind-blown clay dunes along streams. Clay soils of extreme south Texas derived from the Beaumont clay series could be considered suitable for establishment of this species. Most known remnant populations are found along roadways,

railways, and on disturbed sites (Lonard, 1987). South Texas ambrosia is difficult to detect because it is generally overtopped by grasses (Turner, 1983). No critical habitat has been designated for this species.

2.1.3 Range

South Texas ambrosia is known only from the southern tip of Texas and from Tamaulipas, Mexico (Correll and Johnston, 1970; Turner, 1983). It was first collected by J.L. Berlandier in San Fernando, Tamaulipas, Mexico, in 1835 (Turner, 1983), but it was not until 1859 that Gray described this species as new to science. Historically, South Texas ambrosia was known only from Kleberg, Nueces, Jim Wells, and Cameron counties in the Gulf Prairie region of Texas and Tamaulipas in Mexico. The status of the Mexican populations is unknown.

2.1.4 Distribution in Texas

The species has been historically reported from Jim Wells and Cameron counties, although it is currently verified in six general locations in Nueces and Kleberg counties (TPWD, 1999a).

2.1.5 Presence in the Project Area

This species is not expected to occur in the project area due to the lack of suitable soils. No specimens of this species were encountered in the project area during PBS&J's field efforts.

2.1.6 Effects of the Project

Because this species is not expected to occur in the project area, no direct or indirect effects to the species will occur.

2.1.7 Conservation Measures

No conservation measures are needed because the species is not expected to occur in this project area.

2.1.8 Conclusion

Based on the preceding analysis the overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect the South Texas ambrosia.

2.2 SLENDER RUSH-PEA

2.2.1 Reasons for Status

The slender rush-pea (*Hoffmanseggia tenella*) was Federally listed as endangered on 1 November 1985 (50 FR 45614) and is also listed by the State of Texas as endangered. It is alternately known by the spelling *Hoffmannseggia tenella*, which is used in Federal and State documents. The greatest threats to this species are conversion of coastal prairie habitat to other land uses, use of

herbicides, and competition from non-native grasses such as King Ranch bluestem, Kleberg bluestem (*Dichanthium annulatum*), and bermudagrass (*Cynodon dactylon*) (TPWD, 1997).

2.2.2 Habitat

It grows on calcareous, clayey soils in prairies and creek bands associated with short and midgrasses such as buffalograss, Texas wintergrass (*Stipa leucotricha*), and Texas grama. Woody plants such as honey mesquite, huisache, huisachillo (*Acacia tortuosa*), granjeno, brasil (*Condalia hookeri*), retama, lotebush (*Zizyphus obtusifolia*), tasajillo (*Opuntia leptocaulis*), and pricklypear (*Opuntia* spp.) are also common at the known sites. No critical habitat has been designated for this species.

2.2.3 Range

The slender rush-pea is only known from Texas along the south Texas Gulf coast counties of Kleberg and Nueces (TPWD, 1999c).

2.2.4 Distribution in Texas

The slender rush-pea is known from only three or four populations in Kleberg and Nueces counties (TPWD, 1999c).

2.2.5 Presence in the Project Area

This species is unlikely to occur in the project area due to the lack of suitable soils and habitat.

2.2.6 Effects of the Project

Because this species is not expected to occur in the project area, no direct or indirect effects to the species will occur.

2.2.7 Conservation Measures

No conservation measures are needed because the species is not expected to occur in this project area.

2.2.8 Conclusion

Based on the preceding analysis the overall conclusion of this Biological Assessment is that the proposed project is not likely to affect the slender rush-pea.

2.3 KEMP'S RIDLEY SEA TURTLE

2.3.1 Reasons for Status

Kemp's ridley (*Lepidochelys kempii*) was listed as endangered throughout its range on 2 December 1970 (35 FR 18320). Populations of this species have declined since 1947, when an estimated 42,000 females nested in one day, to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily due to human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of incidental take by shrimp trawlers (FWS and NMFS, 1992; NMFS, 2000). The National Research Council's (NRC's) Committee on Sea Turtle Conservation estimated in 1990 that 86% of the human-caused deaths of juvenile and adult loggerheads and Kemp's ridleys resulted from shrimp trawling (Campbell, 1995). It is estimated that before the implementation of turtle excluder devices (TEDs) the commercial shrimp fleet killed between 500 and 5,000 Kemp's ridleys each year (NMFS, 2000). Kemp's ridleys have also been taken by pound nets, gill nets, hook and line, crab traps, and longlines.

Another problem shared by adult and juvenile sea turtles is the ingestion of manmade debris and garbage. Postmortem examinations of sea turtles found stranded on the south Texas coast from 1986 through 1988 revealed 54% (60 of the 111 examined) of the sea turtles had eaten some type of marine debris. Plastic materials were most frequently ingested and included pieces of plastic bags, polystyrene products, plastic pellets, balloons, rope, and fishing line. Non-plastic debris such as glass, tar, and aluminum foil were also ingested by the sea turtles examined. Much of this debris comes from offshore oil rigs, cargo ships, commercial and recreational fishing boats, research vessels, naval ships, and other vessels operating in the Gulf of Mexico. Laws enacted during the late-1980s to regulate this dumping are difficult to enforce over vast expanses of water. In addition to trash, pollution from heavy spills of oil or waste products pose additional threats (Campbell, 1995).

Further threats to this species include collisions with boats, explosives used to remove oil rigs, and entrapment in coastal power plant intake pipes (Campbell, 1995). Hopper dredging operations affect Kemp's ridley turtles through incidental take and by degrading the habitat. Incidental take of ridleys has been documented with hopper dredges. In addition to direct take, channelization of the inshore and nearshore areas can degrade foraging and migratory habitat through dredged material disposal, degraded water quality/clarity, and altered current flow (FWS and NMFS, 1992).

Sea turtles are especially subject to human impacts during the time the females come ashore for nesting. The Kemp's ridley nests during the day primarily during the months of April, May, and June. Modifications to nesting areas can have a devastating effect on sea turtle populations. In many cases, prime sea turtle nesting sites are also prime real estate. If a nesting site has been disturbed or destroyed, female turtles may nest in inferior locations where the hatchlings are less likely to survive, or they may not lay any eggs at all. Artificial lighting from developed beachfront areas often disorients nesting females and hatchling sea turtles, causing them to head inland by mistake, often with fatal results.

Adult females also may avoid brightly lit areas that would otherwise provide suitable nesting sites (FWS, 1998).

Today, under strict protection, the population appears to be in the early stages of recovery. Approximately 6,000 Kemp's ridley nests were recorded on Mexican beaches during the 2000 nesting season (Shaver, 2000). The increase likely can be attributed to two primary factors: full protection of nesting females and their nests in Mexico and the requirement to use TEDs in shrimp trawlers both in the U.S. and in Mexico (NMFS, 2000).

2.3.2 Habitat

Kemp's ridleys inhabit shallow coastal and estuarine waters, usually over sand or mud bottoms. Adults are primarily shallow-water benthic feeders that specialize on crabs, especially portunid crabs, while juveniles feed on sargassum (*Sargassum* sp.) and associated infauna, and other epipelagic species of the Gulf of Mexico (FWS and NMFS, 1992). In some regions the blue crab (*Callinectes sapidus*) is the most common food item of adults and juveniles. Other food items include shrimp, snails, bivalves, sea urchins, jellyfish, sea stars, fish, and occasional marine plants (Pritchard and Marquez, 1973; Shaver, 1991; Campbell, 1995). No critical habitat has been designated for this species.

2.3.3 Range

Adults are primarily restricted to the Gulf of Mexico, although juveniles may range throughout the Atlantic Ocean since they have been observed as far north as Nova Scotia (Musick, 1979) and in coastal waters of Europe (Brongersma, 1972). Important foraging areas include Campeche Bay, Mexico, and Louisiana coastal waters.

Almost the entire population of Kemp's ridleys nests on an 11-mile stretch of coastline near Rancho Nuevo, Tamaulipas, Mexico, some 190 miles south of the Rio Grande. A secondary nesting area occurs at Tuxpan, Veracruz, and sporadic nesting has been reported from Mustang Island, Texas, southward to Isla Aquada, Campeche. There have been several isolated nesting attempts scattered from North Carolina to Colombia.

Because of the dangerous population decline at the time, a head-starting program was carried out from 1978 to 1988. Eggs were collected from Rancho Nuevo and placed into polystyrene foam boxes containing Padre Island sand so that the eggs never touched the Ranch Nuevo sand. The eggs were flown to the U.S. and placed in a hatchery on Padre Island and incubated. The resulting hatchlings were allowed to crawl over the Padre Island beaches into the surf for imprinting purposes before being recovered from the surf and taken to Galveston for rearing. They were fed a diet of high-protein commercial floating pellets for 7 to 15 months before being released into Texas (mainly) or Florida waters (Caillouet et al., 1995). This program has shown some results. The first nesting from one of these head-started individuals occurred at Padre Island in 1996, and more nestings have occurred since (Shaver, 2000).

2.3.4 Distribution in Texas

Kemp's ridley occurs in Texas in small numbers and in many cases may well be in transit between crustacean-rich feeding areas in the northern Gulf of Mexico and breeding grounds in Mexico. It has nested sporadically in Texas in the last 50 years. Nests were found near Yarbrough Pass in 1948 and 1950, and in 1960 a single nest was located at Port Aransas. The number of nestings, however, has increased in recent years. In 1999, 16 confirmed Kemp's ridley nests were recorded in Texas and 12 nests were confirmed for 2000 (Shaver, 2000). Several of the ridley nests were from head-started individuals. Such nestings, together with the proximity of the Rancho Nuevo rookery, probably accounts for the occurrence of hatchlings and subadults in Texas. According to Hildebrand (1982, 1986, 1987), sporadic ridley nesting in Texas has always been the case. This is in direct contradiction, however, to Lund (1974), who believed that Padre Island historically supported large numbers of nesting Kemp's ridleys, but that the population became extirpated because of excessive egg collection.

2.3.5 Presence in the Project Area

Kemp's ridley has been recorded from Nueces County (Dixon, 2000) and from Corpus Christi Bay (Shaver, 2000). Thus, it is of potential occurrence in the project area.

2.3.6 Effects of the Project to Sea Turtles

The following discussion will be referenced for all sea turtles included in this BA. Section 7 consultation with NMFS concluded in their concurrence that endangered and threatened turtles in the aquatic environment will not be affected by this project. No hopper dredging will occur during either project construction or maintenance, precluding possible impacts to swimming turtles from dredging. In addition, all effluent from confined upland PAs will meet state water quality criteria. Submerged aquatic vegetation that will be directly impacted by project construction will be mitigated and replaced at a ratio of 3:1. Potential secondary project impacts to MBHC will be monitored as described above. Potential beneficial affects of the project include providing an additional channel that will facilitate access to the rich seagrass beds of the Laguna Madre from the Gulf, and providing new foraging substrate on the rock jetties.

There may be times when eggs, nesting turtles, hatchlings, and stranded turtles could be directly vulnerable to project construction and maintenance impacts, and potential nesting habitat will be removed by channel construction. There is, however, no documentation of turtle nesting or stranding along this highly utilized public beach.

The Kemp's ridley will not be impacted by dredging activities during either construction or by maintenance dredging activities after construction, because cutterhead dredges will be used. Unlike hopper dredges, cutterhead dredges move very slowly and can be avoided by all species of sea turtles. Studies have indicated that cutterhead dredges, since they act on only small areas at a time, do not impact sea turtles (NMFS, 1998). Hopper dredges move much more rapidly than cutterhead dredges and "can entrain and kill sea turtles, presumably as the drag arm of the moving dredge overtakes the slower

moving turtle" (NMFS, 1998). Since all dredging of the proposed Packery Channel will be performed by cutterhead dredges, no impacts to Kemp's ridley sea turtles are anticipated from dredging.

Operation of construction-related vehicles on the beach can crush nesting turtles, stranded turtles, hatchlings, and eggs (Mann, 1977; NMFS and U.S. Fish & Wildlife Service, 1991a, 1991b, 1992, 1993; Ernest et al., 1998). Vehicles could also remove sea turtle tracks, making it difficult to find possible nests for protection. Ruts from vehicles can trap hatchlings and smaller stranded turtles and may result in death (Hosier et al, 1981; Fletemeyer, 1996, Ernest et al., 1998). Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity leading to increased false crawls and nests with shallow egg chambers (Fletemeyer, 1996). Compaction could also make it more difficult for hatchlings to emerge from an undetected nest. Data on level of compaction from beach driving necessary to inhibit or prevent nesting, or inhibit or prevent hatchling emergence is not available.

Vibrations and noise caused by moving vehicles on the beach during construction could frighten nesting turtles, causing them to abandon their nesting attempt (NMFS and USFWS 1991a, 1991b, 1992; Ernest et al., 1998). Vibrations could also harm incubating eggs. It is difficult to assess these areas as scientific data is lacking for the Kemp's ridley related to traffic vibrations or noise. Vibrations could affect sea turtles either during nest site selection after exiting the water or once the eggs are laid. Vibrations could cause sea turtles to abandon a nesting attempt resulting in a false crawl and causing a sea turtle to re-enter the water and nest in another location. Turtles do not respond to vibrations once egg-laying has begun.

Vehicle lights can also cause direct and indirect impacts on nesting turtles leading to false crawls and can disorient hatchlings so that they crawl in the wrong direction rather than enter the sea, thereby becoming directly vulnerable to crushing, predation, and dehydration (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). Construction vehicles will not be used at night, nor will artificial lighting be used for construction. It is unlikely that nesting Kemp's ridley turtles will be affected by artificial lights since they are primarily daytime nesters.

2.3.7 Conservation Measures

This project may potentially impact Kemp's ridley sea turtles if they are present in the project area during construction. However, conservation measures and monitoring of construction will be implemented to reduce the potential impact on this species, and help to ensure that the project is not likely to adversely affect this turtle.

During construction, the beach will be monitored daily prior to initiation of any construction activities that could impact sea turtles. A FWS-approved monitor will be hired by the construction contractor and immediately report any sea turtles, tracks, or nests to the FWS and the Corps Construction Inspector. Construction personnel, Corps construction inspectors, and City representatives will receive training to recognize and avoid impacts to sea turtles, and to understand the reporting and monitoring requirements for the project. Any turtle, nests, or eggs found by monitors or reported by

construction personnel will be safe-guarded until they can be relocated by the appropriate authorities. Ruts in the beach will be smoothed out at the end of construction each day so that turtle tracks can be found and small turtles will not become entrapped. Night light interference is not anticipated for this project, but can be avoided by the use of directional and shielded lighting if necessary. After construction, public education signs will be posted along the jetties describing sea turtles and providing information on what to do and whom to call in the event turtles are found on the beach.

2.3.8 Conclusion

There has been heavy public use, park lighting, lights from recreational vehicles and condominiums, routine beach maintenance by the county, and vehicle and pedestrian use of the beach in the project area for many years with no documented case of crushing a nesting sea turtle or hatchling. The risk to a Kemp's ridley sea turtle in this project area is considered very limited, and will be avoided by monitoring and conservation measures undertaken during construction. Through these measures potential adverse affects to the Kemp's ridley sea turtle will be avoided.

2.4 GREEN SEA TURTLE

2.4.1 Reasons for Status

The green sea turtle (*Chelonia mydas*) was listed on 28 July 1978 as threatened except for Florida and the Pacific coast of Mexico (including the Gulf of California) where it was listed as endangered (43 FR 32808). The greatest cause of decline in green sea turtle populations is commercial harvest for eggs and food. Other turtle parts are used for leather and jewelry, and small turtles are sometimes stuffed for curios. Incidental catch during commercial shrimp trawling is a continued source of mortality that adversely affects recovery. It is estimated that before the implementation of TED requirements, the offshore commercial shrimp fleet captured about 925 green sea turtles a year, of which approximately 225 would die. Most turtles killed are juveniles and subadults. Various other fishing operations also negatively impact this species (NMFS, 2000). Epidemic outbreaks of fibropapilloma or "tumor" infections recently have occurred on green sea turtles, especially in Hawaii and Florida, posing a severe threat. The cause of these outbreaks is largely unknown, but it could be caused by a viral infection (Barrett, 1996). Some scientists suspect this disease to be linked to environmental alteration of sea turtle habitat by pollution and contaminants (FWS, 1998). This species is also subject to various negative impacts shared by sea turtles in general.

2.4.2 Habitat

The green sea turtle primarily utilizes shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and seagrasses. Individuals observed in the open ocean are believed to be migrants en route to feeding grounds or nesting beaches (Meylan, 1982). Hatchlings often float in masses of sea plants (e.g., sargassum) in convergence zones. Coral reefs and rocky outcrops near feeding pastures often are used as resting areas. The adults are primarily herbivorous, while the juveniles consume more invertebrates. Foods consumed include

seagrasses, macroalgae and other marine plants, molluscs, sponges crustaceans, and jellyfish (Mortimer, 1982; Green, unpubl. data).

Terrestrial habitat is typically limited to nesting activities, although in some areas, such as Hawaii and the Galápagos Islands, they will bask on beaches (Balazs, 1980; Green, unpubl. data). They prefer high energy beaches with deep sand, which may be coarse to fine, with little organic content. At least in some regions, they generally nest consistently at the same beach, which is apparently their natal beach (Meylan et al., 1990; Allard et al., 1994), although an individual might switch to a different nesting beach within a single nesting season (Green, unpubl. data). No critical habitat has been designated for this species.

2.4.3 Range

The green sea turtle is a circumglobal species in tropical and sub-tropical waters. In U.S. Atlantic waters, it is found around the U.S. Virgin Islands, Puerto Rico, and continental U.S. from Massachusetts to Texas. Major nesting activity occurs on Ascension Island, Aves Island (Venezuela), Costa Rica, and in Surinam. Relatively small numbers nest in Florida, with even smaller numbers in Georgia, North Carolina, and Texas (NMFS and FWS, 1991a; Hirth, 1997).

2.4.4 Distribution in Texas

The green sea turtle in Texas inhabits shallow bays and estuaries where its principal foods, the various marine grasses, grow (Bartlett and Bartlett, 1999). Its population in Texas has suffered a decline similar to that of its world population. In the mid- to late-nineteenth century, Texas waters supported a green sea turtle fishery. Most of the turtles were caught in Matagorda Bay, Aransas Bay, and the Lower Laguna Madre, although a few also came from Galveston Bay. Many live turtles were shipped to places such as New Orleans or New York and from there to other areas. Others were processed into canned products such as meat or soup prior to shipment. By 1900, however, the fishery had virtually ceased to exist. Turtles continued to be hunted sporadically for a while, the last Texas turtler hanging up his nets in 1935. Incidental catches by fisherman and shrimpers were sometimes marked prior to 1963, when it became illegal to do so (Hildebrand, 1982).

Green sea turtles can still be found in these same bays today but in much-reduced numbers (Hildebrand, 1982). While green sea turtles prefer to inhabit bays with seagrass meadows, they may also be found in bays that are devoid of seagrasses. The green sea turtles in these Texas bays are mainly small juveniles. Adults, juveniles, and even hatchlings are occasionally caught on trotlines or by offshore shrimpers or are washed ashore in a moribund condition.

Green sea turtle nests are rare in Texas. The green sea turtle is a nocturnal nester, nesting during the months of May through September. The most recent, a single nest, occurred in 2000; no green sea turtle nests were recorded in 1999. In comparison, 16 Kemp's ridley and 2 loggerhead nests were recorded in 1999 and 12 Kemp's ridley and 5 loggerhead nests were recorded in 2000 (Shaver, 2000). Green sea turtles, however, nest in Florida and in Mexico. Since long migrations of

green sea turtles from their nesting beaches to distant feedings grounds are well documented (Meylan, 1982; Green, 1984), the adult green sea turtles occurring in Texas may either be at their feeding grounds or in the process of migrating to or from their nesting beaches. The juveniles frequenting the seagrass meadows of the bay areas may remain there until such time as they move to other feeding grounds or, perhaps, once having attained sexual maturity, return to their natal beaches outside of Texas to nest.

2.4.5 Presence in the Project Area

The green sea turtle has been recorded from Nueces County (Dixon, 2000) and has been recorded from Corpus Christi Bay (Shaver, 2000). It is of potential occurrence in the project area.

2.4.6 Effects of the Project

No impacts to the green sea turtle from dredging activities during construction or maintenance of Packery Channel are expected, for the reasons stated in Section 2.3.6., above. This species could be attracted to feeding opportunities at the proposed jetties and channel, which might facilitate passage by the turtles between the open Gulf of Mexico and feeding areas in the seagrass beds of the Laguna Madre, which is a beneficial project effect.

2.4.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.2.7, above).

2.4.8 Conclusions

For the reasons cited in Section 2.3.8, the risk to a green sea turtle in this project area is considered very limited, and will be avoided by monitoring and conservation measures undertaken during construction. Through these measures potential adverse affects to the green sea turtle will be avoided.

2.5 LOGGERHEAD SEA TURTLE

2.5.1 Reasons for Status

The loggerhead turtle (*Caretta caretta*) was listed as threatened throughout its range on 28 July 1978 (43 FR 32808). The decline of the loggerhead, like that of most sea turtles, can be attributed to overexploitation by man, inadvertent mortality associated with fishing and trawling activities, and natural predation. The most significant threats to its population are coastal development, commercial fisheries, and pollution (NMFS, 2000).

2.5.2 Habitat

The loggerhead is found in the open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, creeks, and mouths of rivers. It favors warm temperate and sub-tropical regions not far from shorelines. The adults occupy various habitats, from

turbid bays to clear waters of reefs. Subadults occur mainly in nearshore and estuarine waters. Hatchlings move directly to sea after hatching, and often float in masses of sargassum. They may remain associated with sargassum for perhaps 3 to 5 years (NMFS and FWS, 1991b).

Commensurate with their use of varied habitats, loggerheads consume a wide variety of both benthic and pelagic food items, which they crush before swallowing. Conches, shellfish, horseshoe crabs, prawns and other crustacea, squid, sponges, jellyfish, basket stars, fish (carion or slow-moving species), and even hatchling loggerheads have all been recorded as loggerhead prey (Rebel, 1974; Hughes, 1974; Mortimer, 1982). Adults forage primarily on the bottom, but also take jellyfish from the surface. The young feed on prey concentrated at the surface, such as gastropods, fragments of crustaceans, and sargassum.

Nesting occurs usually on open sandy beaches above high-tide mark and seaward of well developed dunes. They nest primarily on high-energy beaches on barrier islands adjacent to continental land masses in warm-temperate and sub-tropical regions. Steeply sloped beaches with gradually sloped offshore approaches are favored. In Florida, nesting on urban beaches was strongly correlated with the presence of tall objects (trees or buildings), which apparently shield the beach from city lights (Salmon et al., 1995). No critical habitat has been designated for this species.

2.5.3 Range

The loggerhead is widely distributed in tropical and subtropical seas, being found in the Atlantic Ocean from Nova Scotia to Argentina, Gulf of Mexico, Indian and Pacific oceans (although it is rare in the eastern and central Pacific) and the Mediterranean Sea (Rebel, 1974; Ross, 1982; Iverson, 1986). In the continental U.S., loggerheads nest along the Atlantic coast from Florida to as far north as New Jersey (Musick, 1979) and sporadically along the Gulf coast. In recent years a few have nested on barrier islands along the Texas coast. The loggerhead is a nocturnal nester, nesting primarily between mid-May and early August.

2.5.4 Distribution in Texas

The loggerhead is considered to be the most abundant turtle in Texas marine waters, preferring shallow inner continental shelf waters and occurring only very infrequently in the bays. It is also the species most commonly sighted around offshore oil rig platforms and reefs and jetties. Loggerheads are probably present year-round but are most noticeable in the spring when one of their food items, the Portuguese Man-of-War, is abundant. Loggerheads constitute a major portion of the dead or moribund turtles washed ashore (stranded) on the Texas coast each year. A large proportion of these deaths is due to the activities of shrimp trawlers where turtles are accidentally caught in the nets and drown and their bodies dumped overboard. Prior to 1977, no positive documentation of loggerhead nests in Texas existed (Hildebrand, 1982). Since that time, several nests have been recorded along the Texas coast. In 1999, two loggerhead nests were confirmed in Texas, while in 2000, five loggerhead nests were confirmed (Shaver, 2000). Like the worldwide population, the population of loggerheads in Texas has declined. Prior to World War I, the species was taken in Texas for local consumption and a few were

marketed (Hildebrand, 1982). Today, even without protection, insufficient loggerheads exist to support a fishery.

2.5.5 Presence in the Project Area

The loggerhead has been recorded in Nueces County (Dixon, 2000) and from Corpus Christi Bay (Shaver, 2000). It is of potential occurrence in the project area.

2.5.6 Effects of the Project

No impacts to the loggerhead, if it occurs in the project area, are expected from dredging activities during construction or maintenance of Packery Channel, for the reasons stated in Section 2.3.6., above. Construction of jetties and bulkheads could provide additional foraging habitat for the loggerhead turtle.

2.5.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.2.7, above).

2.5.8 Conclusions

For the reasons cited in Section 2.3.8, the risk to a loggerhead sea turtle in this project area is considered very limited, and will be avoided by monitoring and conservation measures undertaken during construction. Through these measures potential adverse affects to the loggerhead sea turtle will be avoided.

2.6 HAWKSBILL SEA TURTLE

2.6.1 Reasons for Status

The hawksbill turtle (*Eretmochelys imbricata*) was Federally listed as endangered on 2 June 1970 (35 FR 8495) with Critical Habitat designated in Puerto Rico on 24 May 1978 (43 FR 22224). The greatest threat to this species is harvest to supply the market for tortoiseshell and stuffed turtle curios (Meylan and Donnelly, 1999). Hawksbill shell (bekko) commands high prices (recently \$225/kilogram (kg)). Japanese imports of raw bekko between 1970 and 1989 totaled 713,850 kg, representing more than 670,000 turtles. The hawksbill is also used in the manufacture of leather, oil, perfume, and cosmetics (NMFS, 2000).

2.6.2 Habitat

Hawksbills generally inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they are typically found at depths of less than 70 ft. Like some other sea turtle species, hatchlings are sometimes found floating in masses of marine plants (e.g., sargassum rafts) in the open ocean (NFWL, 1980). Hawksbills reenter coastal waters when they reach a carapace length of

approximately 20 to 25 centimeters. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults, and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. Hawksbills are also found around rocky outcrops and high-energy shoals, which are also optimum sites for sponge growth. In Texas, juvenile hawksbills are associated with stone jetties (NMFS, 2000).

While this species is omnivorous, it prefers invertebrates, especially encrusting organisms, such as sponges, tunicates, bryozoans, mollusks, corals, barnacles, and sea urchins. Pelagic species consumed include jellyfish and fish, and plant material such as algae, sea grasses and mangroves, has also been reported as food items for this turtle (Carr, 1952; Rebel, 1974; Pritchard, 1977; Musick, 1979; Mortimer, 1982). The young are reported to be somewhat more herbivorous than the adults (Ernst and Barbour, 1972).

Terrestrial habitat is typically limited to nesting activities. They nest on undisturbed, deep-sand beaches, from high-energy ocean beaches to tiny pocket beaches several meters wide bounded by crevices of cliff walls. Typically, the sand beaches are low energy, with woody vegetation, such as sea grape (*Coccoloba uvifera*), near the waterline (NRC, 1990). The hawksbill is typically a solitary nester, which makes it harder to monitor nesting activity and success (NMFS, 2000). No critical habitat has been designated for this species in the Packery Channel project area.

2.6.3 Range

The hawksbill is circumtropical, occurring in tropical and subtropical seas of the Atlantic, Pacific, and Indian oceans (Witzell, 1983). This species is probably the most tropical of all marine turtles, although it does occur in many temperate regions. The hawksbill turtle is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas), south to Brazil (NMFS, 2000). In the continental U.S., the hawksbill nests only in Florida where it is sporadic at best (NFWL, 1980). However, a major nesting beach exists on Mona Island, Puerto Rico. The hawksbill is primarily a nocturnal nester, nesting from April to October in the Caribbean. Elsewhere in the western Atlantic, hawksbills nest in small numbers along the Gulf coast of Mexico, the West Indies, and along the Caribbean coasts of Central and South America (Musick, 1979).

2.6.4 Distribution in Texas

Texas is the only State outside of Florida where hawksbills are sighted with any regularity. Most of these sightings involve posthatchlings and juveniles, and are primarily associated with stone jetties. These small turtles are believed to originate from nesting beaches in Mexico (NMFS, 2000).

2.6.5 Presence in the Project Area

The hawksbill has been recorded from Nueces County (Dixon, 2000) and from Corpus Christi Bay (Shaver, 2000). It is of potential, though unlikely, occurrence in the project area.

2.6.6 Effects of the Project

Because most of the sightings of the hawksbill sea turtle in the northern Gulf of Mexico occur at stone jetties, this species could occur near the proposed jetties and bulkheads. However, no impacts to the hawksbill sea turtle from dredging activities during construction or maintenance of Packery Channel are expected, for the reasons stated in Section 2.3.6. Construction of jetties and bulkheads could provide additional foraging habitat for the hawksbill sea turtle, which is a positive affect of this project.

2.6.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.2.7, above).

2.6.8 Conclusions

For the reasons cited in Section 2.3.8, the risk to a hawksbill sea turtle in this project area is considered very limited, and will be avoided by monitoring and conservation measures undertaken during construction. Through these measures potential adverse affects to the hawksbill sea turtle will be avoided.

2.7 LEATHERBACK SEA TURTLE

2.7.1 Reasons for Status

The leatherback turtle (*Dermochelys coriacea*) was listed as endangered throughout its range on 2 June 1970 (35 FR 8495), with Critical Habitat designated in the U.S. Virgin Islands on 26 September 1978 and 23 March 1979 (43 FR 43688/43689 and 44 FR 17710/17712, respectively). Its decline is attributable to overexploitation by man and incidental mortality associated with commercial shrimping and fishing activities. Use of turtle meat for fish bait and the consumption of litter by turtles have also been mentioned as causes for mortality, the latter phenomenon apparently occurring when plastic is mistaken for jellyfish (Rebel, 1974). While nesting populations of leatherback sea turtles are especially difficult to discern because the females frequently change nesting beaches, current estimates are that 20,000 to 30,000 female leatherbacks exist worldwide. The major threat is egg collecting, although they are jeopardized to some extent by destruction or degradation of nesting habitat (NatureServe, 2000). Egg collecting is not currently a problem in Florida, but remains a problem in Puerto Rico and the U.S. Virgin Islands (NMFS and FWS, 1992). This species is probably more susceptible than other turtles to drowning in shrimp trawlers equipped with TEDs because adult leatherbacks are too large to pass through the TED exit opening. Because leatherbacks nest in the tropics during hurricane season, a potential exists for storm-generated waves and wind to erode nesting beaches, resulting in nest loss (NMFS and FWS, 1992).

2.7.2 Habitat

The leatherback turtle is mainly pelagic, inhabiting the open ocean, and seldom approaches land except for nesting (Eckert, 1992). It is most often found in coastal waters only when nesting or when following concentrations of jellyfish (TPWD, 2000), when it can be found in inshore waters, bays, and estuaries. It dives almost continuously, often to great depths.

Despite their large size, the diet of leatherbacks consists largely of jellyfish and sea squirts. They also consume sea urchins, squid, crustaceans, fish, blue-green algae, and floating seaweed (NFWL, 1980). The leatherback typically nests on beaches with a deepwater approach (Pritchard, 1971). No critical habitat has been designated in the Packery Channel Project area.

2.7.3 Range

The leatherback is probably the most wide-ranging of all sea turtle species. It is found in the Atlantic, Pacific and Indian oceans; as far north as British Columbia, Newfoundland, Great Britain and Norway; as far south as Australia, Cape of Good Hope, and Argentina; and in other water bodies such as the Mediterranean Sea (NFWL, 1980). Leatherbacks nest primarily in tropical regions; major nesting beaches include Malaysia, Mexico, French Guiana, Surinam, Costa Rica, and Trinidad (Ross, 1982). Leatherbacks nest only sporadically in some of the Atlantic and Gulf states of the continental U.S., with one nesting reported as far north as North Carolina (Schwartz, 1976). In the Atlantic and Caribbean, the largest nesting assemblages are found in the U.S. Virgin Islands, Puerto Rico, and Florida (NMFS, 2000).

The leatherback migrates further and ventures into colder water than any other marine reptile. Adults appear to engage in routine migrations between boreal, temperate, and tropical waters, presumably to optimize both foraging and nesting opportunities. The longest-known movement is that of an adult female that traveled 5,900 km to Ghana, West Africa, after nesting in Surinam (NMFS and FWS, 1992). During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

2.7.4 Distribution in Texas

Apart from occasional feeding aggregations such as one of 100 animals reported by Leary (1957) off Port Aransas in December 1956, or possible concentrations in the Brownsville Eddy in winter (Hildebrand, 1983), leatherbacks are rare along the Texas coast, tending to keep to deeper offshore waters where their primary food source, jellyfish, occurs. In the Gulf of Mexico the leatherback is often associated with two species of jellyfish: the cabbagehead (*Stomolophus* sp.) and the moon jellyfish (*Aurelia* sp.) (NMFS and FWS, 1992). According to FWS (1981), leatherbacks never have been common in Texas waters. No nests of this species have been recorded for at least 60 years. The last two, one from the late 1920s and one from the mid-1930s, were both from Padre Island (Hildebrand, 1982, 1986). The leatherback is a nocturnal nester, nesting from February to July in the Caribbean.

2.7.5 Presence in the Project Area

While the leatherback has been recorded from Nueces County (Dixon, 2000), it is unlikely to occur in the project area.

2.7.6 Effects of the Project

Of the five species of sea turtles occurring in Texas waters, the leatherback is the species least likely to be affected by the proposed project because of its rare occurrence and pelagic nature. As discussed above, dredging during construction and maintenance activities will not impact this turtle. Other potential construction impacts are discussed in Section 2.3.6, above.

2.7.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.2.7, above).

2.7.8 Conclusions

For the reasons cited in Section 2.3.8, the risk to a leatherback sea turtle in this project area is considered very limited, and will be avoided by monitoring and conservation measures undertaken during construction. Through these measures potential adverse affects to the leatherback sea turtle will be avoided.

2.8 BROWN PELICAN

2.8.1 Reasons for Status

The brown pelican (*Pelecanus occidentalis*) was listed as endangered throughout its foreign range on 2 June 1970 (35 FR 8495) and throughout its U.S. range on 13 October 1970 (35 FR 16047). Population declines were attributed largely to chlorinated hydrocarbon residues from the use of pesticides, such as DDT compounds (DDE, DDD and DDT), polychlorinated biphenyls (PCBs), dieldrin, and endrin which caused eggshell thinning; thus eggs became desiccated and were more easily broken during incubation (NFWL, 1980). Other factors included human disturbance and loss of habitat due to commercial and residential development (FWS, 1995). Pelicans are large, heavy birds and easily flushed from the nest. Flushing exposes the eggs and young to predation, temperature stress and permanent abandonment by the parents.

A ban on the use of DDT in the U.S. in 1972, together with efforts to conserve and improve remaining populations, has led to increased numbers of brown pelicans. Populations in some areas have increased to historical breeding levels or above, with stable population numbers and productivity. The brown pelican has been delisted along the U.S. Atlantic coast and, in Florida and Alabama, along the Gulf coast. It remains endangered throughout the rest of its range, which includes Mississippi, Louisiana, Texas, California, Mexico, Central and South America, and the West Indies. In

May 1998, the FWS announced its intention to either delist or downlist to threatened status numerous species, including the brown pelican (63 FR 25502-25512; 8 May 1998).

2.8.2 Habitat

Brown pelicans inhabit shallow coastal waters with water depths up to 80 ft (Palmer, 1962; NFWL, 1980; Fritts et al., 1983). They are rarely found inland and do not venture more than 20 miles out to sea except to take advantage of particularly good feeding situations (FWS, 1980). Distances of 61 miles from shore have been recorded (Fritts et al., 1983). Brown pelicans, which are colonial nesters, usually nest on undisturbed offshore islands in small bushes and trees, including mangroves, and in humid forests (NFWL, 1980; Guzman and Schreiber, 1987). Occasionally they nest on the ground. Preferred sites are those free from human disturbance, flooding and terrestrial predators such as raccoons. Brown pelicans utilize beaches, sandbars, sandspits, mud flats and even manmade structures such as piers, wharves, pilings, oil/gas platforms, and docks for loafing (NFWL, 1980). No critical habitat has been designated for this species.

2.8.3 Range

The brown pelican occurs along the Pacific coast of the Americas from southern British Columbia south to Cape Horn, and throughout the Atlantic, Gulf and Caribbean coastal areas from New Jersey south to eastern Venezuela. In North America, it occasionally ventures inland north to North Dakota, Ontario and Nova Scotia. Its breeding range is more restricted: along the Pacific coast from central California south to Chile, including the Galápagos Islands; and from North Carolina, south to eastern Venezuela, the West Indies, Greater Antilles, and Virgin Islands (American Ornithologists' Union (AOU), 1998).

In North America, two subspecies are recognized: the eastern brown pelican (*P.o. carolinensis*) ranging from North Carolina south through Florida and west to Texas, and the California brown pelican (*P.o. californicus*) in California (NFWL, 1980). For the eastern subspecies, the present range is the same as the historical one, but in reduced numbers. It became extirpated in Louisiana in 1966, but has since (beginning in 1968) been reintroduced from Florida. It has never been known to nest in Mississippi or Georgia (FWS, 1980; 50 FR 4938, 9 February 1985). Brown pelican colonies are known to occur on the east coast of Mexico off the eastern tip of the Yucatan Peninsula (Mabie, 1986, 1988).

While some migration occurs after nesting in both subspecies, many individuals overwinter close to their breeding grounds (FWS, 1980). Atlantic coast populations move southward in the fall, with most birds wintering in the U.S., particularly in Florida. Some birds, however, disperse to the Cuban coast (Clapp et al., 1982). Gulf coast birds tend to remain on the Gulf coast, although Texas and Louisiana birds have been recovered in Mexico and Cuba (Palmer, 1962; Clapp et al., 1982).

2.8.4 Distribution in Texas

Historically, the brown pelican was a common bird of the Texas Gulf coast with an estimated breeding population of 5,000 pairs residing in 17 colonies in 1918 (Mabie, 1990). By the

1960s, however, it was almost extirpated. In 1963, only 14 breeding pairs were recorded along the Texas coast; in 1964 no known nesting occurred (Mabie, 1986). The decline started during the 1920s and 1930s due to human disturbance (Oberholser, 1974), but has continued due to pesticide contamination (King et al., 1977; Mabie, 1986). Since the 1960s, the brown pelican has made a gradual comeback in Texas with an estimated 2,400 breeding pairs in 1995 (Campbell, 1995). Most of the breeding birds are found on Pelican Island in Corpus Christi Bay, Nueces County, and Sundown Island near Port O'Connor in Matagorda County. Smaller groups or colonies occasionally nest on Bird Island in Matagorda Bay, a series of older dredged material islands in West Matagorda Bay, Dressing Point Island in East Matagorda Bay, and islands in Aransas Bay (Campbell, 1995). No nesting sites are known from the lower Texas Coast. Although brown pelican colonies are not monitored every year, 1,100 pairs nested on Pelican Island in 2000, while on Sundown Island, 698 pairs nested in 2000 and 1,200 pairs nested in 1999 (FWS, 2000b).

2.8.5 Presence in the Project Area

In Texas, the brown pelican occurs from Chambers County to Cameron County (Campbell, 1995) and primarily along the lower and middle coasts. Occasional sightings are reported on the upper coast and inland to central, north-central, and eastern Texas (Texas Ornithological Society (TOS), 1995), usually on large freshwater lakes. Such occurrences are relatively uncommon. Pelican Island is located in Corpus Christi Bay approximately 14 miles north of the proposed project. Brown pelicans are likely occur in the project area and immediate vicinity.

2.8.6 Effects of the Project

This species is expected to forage in the project area or general vicinity on occasion, and it could potentially be temporarily affected from noise and activity from the proposed project. Because the nearest active nesting colony is at Pelican Island approximately 14 miles north of the proposed project, nesting pelicans will not be impacted by the project. Direct effects may result from construction-related vehicles and activities. Construction activities may displace brown pelicans causing them to take flight and either fly along the shoreline to another suitable location or fly offshore. This displacement will be temporary since shorebirds disturbed by traffic or human activities generally move a short distance away and continue to perform their pre-disturbance behavior. No indirect effects of the proposed project are thought to occur.

2.8.7 Conservation Measures

Because of the transitory nature of potential construction impacts and no impacts to nesting birds, no conservation measures are identified.

2.8.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect the brown pelican.

2.9 BALD EAGLE

2.9.1 Reasons for Status

The bald eagle (*Haliaeetus leucocephalus*) was first granted legal protection with the Eagle Protection Act, passed on 8 June 1940 and amended 23 October 1972. The species was listed as endangered below the 40th parallel on 11 March 1967 (32 FR 4001) and later received protection under the Endangered Species Act of 1973. The legal status of the species was changed on 14 February 1978 (43 FR 6233) to endangered in the conterminous U.S. except for Washington, Oregon, Minnesota, Wisconsin, and Michigan, where it was designated as threatened (FWS, 1984). The bald eagle recovered sufficiently to be downlisted to threatened throughout its range and FWS has proposed to completely delist the species in the near future (64 FR 36453-36464; 6 July 1999).

Several factors have contributed to the decline of the bald eagle since the settling of North America. The primary factor in direct loss is shooting (Snow, 1981). Mortality through shooting, however, is on the decline. Between 1975 and 1981, 18% of the total reported mortalities were due to shooting, compared to 62% between 1961 and 1965 (FWS, 1984).

Historically, increase in human population has resulted in extensive alterations in land use. Because the eagles nest near water, increased recreation and other human use of water resources have had negative effects on the bald eagle. The greater use of boats, off-road vehicles, and snowmobiles, and increased development of waterfront property have severely altered eagle habitat (Snow, 1981). New wintering and non-nesting habitat, however, is now being created by the construction of reservoirs, which may also be used more in the future by nesting eagles, potentially resulting in a major redistribution of nesting (FWS, 1984).

Environmental contaminants are responsible for the greatest decline in eagle populations. Organochloride pesticides inhibit calcium metabolism, resulting in thin eggshells and, thus, reproductive failure. Since the use of DDT and other organochloride pesticides was banned in the U.S., the eagles have slowly recovered. Most populations of bald eagles appear to be producing young at a normal rate (FWS, 1984).

2.9.2 Habitat

The bald eagle inhabits coastal areas, rivers and large bodies of water. Water is the common feature of its nesting habitat (Green, 1985). Because fish and waterfowl comprise the bulk of the bald eagle's diet, nests of the species are seldom far from a river, lake, bay, or other water body. Nests are generally built in trees, and usually positioned so that a clear flight path exists to at least one side of the nest as well as providing excellent visibility, often with an unobstructed view of water. Nest trees may be in woodlands, woodland edges, or open areas, and are frequently the dominant or co-dominant trees in the area (Green, 1985). Nests on cliffs and rock pinnacles have been reported in parts of the U.S.; nests on manmade structures are rare.

Water is also an important element of the winter habitat, with eagles usually frequenting lakes and major river systems. Wintering bald eagles also use habitats with little or no open water, if rabbits, carrion, or other food items are regularly available (Green, 1985). Winter roosting sites may often be used by several eagles. Critical habitat has not been designated for this species.

2.9.3 Range

The bald eagle ranges throughout North America. Two subspecies are currently recognized based on size and weight: the northern bald eagle (*H.I. alascanus*) and the southern bald eagle (*H.I. leucocephalus*), the former being larger and heavier than the latter. This delineation, however, is of questionable merit due to a continuous size gradient from north to south throughout the range; eagles in the central part of the U.S. are intermediate in size. The northern population nests from central Alaska and the Aleutian Islands, east through Canada, and in the northern states of the U.S. The southern population nests primarily in the estuarine areas of the Atlantic and Gulf coasts from New Jersey to Texas and the lower Mississippi Valley, northern California to Baja California (both coasts), Arizona and New Mexico (Snow, 1981). Wintering ranges of the two populations overlap. Many of the northern bald eagles migrate south for the winter and can even be found as far south as Texas.

The southern eagles tend to be more resident although there is some northward movement during the summer (Snow, 1981). The largest wintering group is in Alaska, where over 3,000 have congregated in the Chilkat Valley during the fall and winter months (Steenhof, 1978).

2.9.4 Distribution in Texas

The southern subspecies nests in Texas along the Gulf coast and on major inland lakes during the winter months, and migrates to more-northern latitudes during the summer. The 1999 bald eagle nesting survey identified 82 nesting territories statewide; the southernmost being in Refugio, Goliad, Victoria, and Matagorda counties. Of these nesting territories, 64 were occupied and 47 nests fledged 73 young (Mitchell, 1999). The northern bald eagle nests in the northern U.S. and Canada during spring and summer, and migrates to the southern U.S., including Texas, during the fall and winter. Concentrations of wintering northern eagles are often found around the shores of reservoirs in Texas, with most wintering concentrations occurring in the eastern part of the state. In Texas, wintering bald eagles have been observed as far south as Cameron County (Oberholser, 1974; Mabie, 1990). They are considered to be a rare permanent resident in the Coastal Bend (Rappole and Blacklock, 1985).

2.9.5 Presence in the Project Area

No nests are known to occur in the project area, nor have any been reported from Nueces County. The nearest known nest is in Refugio County (Mitchell, 1999). The checklist of birds of Mustang Island State Park does not list the bald eagle (Pulich et al., 1985), while the checklist of birds of Padre Island National Seashore (PINS) lists the bald eagle as rare in winter (Southwest Parks and Monuments Association (SPMA), 1990). If the bald eagle should occur in the project area, it would be only as a rare migrant or post-nesting visitor.

2.9.6 Effects of the Project

Given the infrequent occurrence of bald eagles in the general area, no direct or indirect effects to this species are anticipated as a result of the project.

2.9.7 Conservation Measures

Because no potential effects to the bald eagle will occur as a result of the proposed project, no additional conservation measures are needed.

2.9.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect the bald eagle.

2.10 WHOOPING CRANE

2.10.1 Reasons for Status

The whooping crane (*Grus americana*) was Federally listed as endangered on 11 March 1967 (32 FR 4001). Critical Habitat has been designated in Aransas, Calhoun, and Refugio counties in Texas, and includes the Aransas National Wildlife Refuge (NWR). Two experimentally introduced flocks are listed as experimental nonessential populations; in Florida (FR, 22 January 1993) and New Mexico (62 FR 38932). The main factors for the decline of the whooping crane were loss of habitat to agriculture, human disturbance of nesting areas, uncontrolled hunting, and collisions with power lines (NatureServe, 2000). Biological factors, such as delayed sexual maturity and small clutch size prevent rapid population recovery. Drought during the breeding season presents serious hazards to this species (Campbell, 1995). Whooping cranes are vulnerable to loss of habitat along their long migration route (NatureServe, 2000), along which they are still subject to cataclysmic weather events, accidental shooting, collision with power lines, and predators. They are susceptible to avian tuberculosis, avian cholera and lead poisoning (Campbell, 1995). Exposure to disease is a special problem when large numbers of birds are concentrated in limited areas, as often happens during times of drought.

While in Texas, the main population is at risk from chemical spills along the GIWW, which passes through the center of their winter range (Campbell, 1995). The presence of contaminants in the food base is another potential problem on their wintering grounds (Oberholser, 1974), and a late season hurricane or other weather event could be disastrous to this concentrated population.

2.10.2 Habitat

Nesting habitat in Canada is freshwater marshes and wet prairies (NatureServe, 2000), interspersed with numerous potholes and narrow-wooded ridges. Whooping cranes use a variety of habitats during migration (Campbell, 1995). They feed on grain in croplands (Lewis, 1995), and large wetland areas are used for feeding and roosting. Riverine habitats, such as submerged sandbars, are

often used for roosting. The principle winter habitat in Texas is brackish bays, marshes, and salt flats, although whooping cranes sometimes feed in upland sites characterized by oak mottes, grassland swales, and ponds on gently rolling sandy soils (Campbell, 1995).

Summer foods include large insect nymphs or larvae, frogs, rodents, small birds, minnows and berries. During the winter in Texas they eat a wide variety of plant and animal foods. Blue crabs, clams, and berries of Carolina wolfberry (*Lycium carolinianum*) predominate the diet. Foods taken at upland sites include acorns, snails, crayfish, and insects (Campbell, 1995). There is no critical habitat designated for this species in the project area.

2.10.3 Range

Whooping cranes were originally found throughout most of North America. In the nineteenth century, the main breeding area was from the Northwest Territories to the prairie provinces in Canada, and the northern prairie states to Illinois. A non-migratory flock existed in Louisiana, but is now extirpated. Whooping cranes wintered from Florida to New Jersey along the Atlantic Coast, along the Texas Gulf Coast, and in the high plateaus of central Mexico. They now breed in isolated, marshy areas of Wood Buffalo National Park, Northwest Territories, Canada. They winter primarily in the Aransas NWR and adjacent areas of the central Texas Gulf Coast (FWS, 1995). During migration they use various stopover areas in western Canada and the American Midwest.

Two experimental flocks have been established by incubating eggs and rearing the young in captivity before releasing them into the wild. Whoopers were introduced in Grays Lake NWR in Idaho in 1975; these birds winter at Bosque del Apache NWR in central New Mexico. This population is not successfully breeding and will become extirpated. Introduction of another flock to Kissimmee Prairie in Florida began in 1993. The Florida population will be non-migratory (NatureServe, 2000).

2.10.4 Distribution in Texas

The natural wild population of whooping cranes spends its winters at the Aransas NWR, Matagorda Island, Isla San Jose, portions of the Lamar Peninsula, and Weller Point on the east side of San Antonio Bay (NatureServe, 2000). The main stopover points in Texas for migrating birds are in the central and eastern panhandle (FWS, 1995).

2.10.5 Presence in the Project Area

Although the leeward side and interior of Padre Island could provide suitable winter habitat for whooping cranes, Nueces County is outside the migration range of the whooping crane (FWS, 1995). The whooping crane in South Texas is generally restricted to the Aransas NWR in Aransas, Refugio, and Calhoun counties. This species is unlikely to occur in the project area.

2.10.6 Effects of the Project

Given the lack of sightings in the area and the birds' fidelity to its wintering grounds at the Aransas NWR, no direct or indirect effects to the whooping crane are expected from this project.

2.10.7 Conservation Measures

Because no potential effects to the whooping crane will occur as a result of this proposed project, no additional conservation measures are needed.

2.10.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project is not likely to adversely affect the whooping crane.

2.11 PIPING PLOVER

2.11.1 Reasons for Status

The piping plover (*Charadrius melodus*) was Federally listed as endangered on 11 December 1985 for the Great Lakes watershed and was listed as threatened throughout the remainder of its range (50 FR 50726). The rule became effective on 10 January 1986. In 1986, an estimated 2,100 to 2,300 breeding pairs occurred in North America: 1,337 to 1,409 pairs in the northern Great Plains, 19 to 24 pairs in the Great Lakes, and 799 pairs along the Atlantic coast (Haig et al., 1987). Shorebird hunting during the early 1900s caused the first known major decline of piping plovers (Bent, 1929). Since then, loss or modification of habitat due to commercial, residential, and recreational developments, dune stabilization, damming and channelization of rivers (eliminating sandbars, encroachment of vegetation, and altering water flows), and wetland drainage have further contributed to the decline of the species (FWS, 1995). Additional threats include human disturbances through recreational use of habitat, and predation of eggs by feral pets (FWS, 1995).

2.11.2 Habitat

Piping plovers typically inhabit shorelines of oceans, rivers and inland lakes. Nest sites include sandy beaches, especially where scattered tufts of grass are present; sandbars; causeways; bare areas on dredge-created and natural alluvial islands in rivers; gravel pits along rivers; silty flats; and salt-encrusted bare areas of sand, gravel, or pebbly mud on interior alkali lakes and ponds. In the wintering grounds these birds utilize beaches, mud flats, sand flats, dunes, and offshore spoil islands (AOU, 1998; FWS, 1995). One of the most important wintering areas for this species, the Laguna Madre in Mexico, became unsuitable when its water level was stabilized for a fisheries lagoon. In Texas, an estimated 30% of wintering habitat had been lost over a 20-year period (50 FR 50726; 11 December 1985). Critical habitat has been designated for this species in the project area as described below.

2.11.3 Range

The piping plover breeds on the northern Great Plains (Iowa, northwestern Minnesota, Montana, Nebraska, North and South Dakota, Alberta, Manitoba, and Saskatchewan), in the Great Lakes (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario), and along the Atlantic coast from Newfoundland to Virginia and (formerly) North Carolina. It winters on the Atlantic and Gulf of Mexico coasts from North Carolina to Mexico, including coastal Texas, and, less commonly, in the Bahamas and West Indies (AOU, 1998; 50 FR 50726, 11 December 1985). Migration occurs both through the interior of North America east of the Rocky Mountains (especially in the Mississippi Valley) and along the Atlantic coast (AOU, 1998). Little is known about the migration routes of this species.

2.11.4 Distribution in Texas

The piping plover begins arriving to its post-breeding and wintering grounds in Texas in mid- to late-July. Haig and Oring (1985, 1987) found that early in the post-breeding season, piping plovers frequented beaches, but later tended to inhabit ephemeral sand flats along the backside of barrier islands. Observations of wintering piping plovers in Alabama did not indicate a seasonal preference between habitats, but that wintering plovers spent more than 85% of their time on sand flats or mud flats each month (Johnson and Baldassarre, 1988). Along the Texas coast, a correlation appears to exist between tidal height and habitat selection, with piping plovers actively feeding on tidal flats during periods of low tides, and on the Gulf beaches during high tides (Eubanks, 1991; Zonick, et al., 1998; Drake et al., 2000). Winter distribution studies along the Atlantic and Gulf coasts found piping plovers usually occurring in small, unevenly distributed groups along the coast; however, the sites with largest concentrations of plovers consisted of expansive sand flats or mud flats with sandy beach in close proximity (Nicholls and Baldassarre, 1990). Piping plover concentrations in Texas occur in the following counties: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kleberg, Matagorda, Nueces, San Patricio and Willacy (FWS, 1988).

Several areas along the Texas coast have been identified by the FWS as essential wintering habitat for the piping plover. Essential wintering habitat for the piping plover provides the space and requisite resources necessary for the continued existence and growth of piping plover populations and consist of coastal beach, sand-flat and mud-flat habitats.

Critical Habitat has recently been designated in Texas by the FWS (66FR 36074-36078), some of which lies within the study area, from north to south, as follows:

- TX-8 (beach side) - from Fish Pass north
- TX-9 (Laguna Side) – at Fish Pass
- TX-7 (beach side) – from Fish Pass south past proposed Packery Channel extension to St. Bartholomew Street
- TX-6 (Laguna side) – at Packery Channel and north
- TX-5 (Laguna side) – at South Alternative

- TX-3, Subunit 4 (beach side) – at South Alternative
- TX-3, Subunit 3 (Laguna side) – only found at extreme south end of the Study Area.

Figure 3 presents the general boundaries of the Critical Habitat units in reference to the study area. The locations provided above are based on the textual unit description given in FR 66, No. 132 (July 10, 2001), 36038 – 36143. Critical Habitat units TX-6 and TX-7 occur within the project area and will be subject to both direct and indirect project impacts.

2.11.5 Presence in the Project Area

The piping plover is a regular migrant and winter resident along the lower Texas coast (Oberholser 1974; Haig and Oring, 1985, 1987; Haig and Plissner, 1993; TOS, 1995) and wintering birds have been reported along the length of the Texas coast. The checklist of birds of Mustang Island State Park lists the piping plover as a fairly common winter resident and a common migrant (Pulich et al., 1985).

There have been a number of piping plover surveys conducted in the Packery Channel vicinity. The following surveys have been succinctly summarized and the results discussed in the FWS Biological Opinion for USACE Permit No. 18344 (01) (FWS, 1994): Island Botanics and Shiner, Moseley and Associates (SMA) (1992); Zonick and Ryan (1993a); Zonick and Ryan (1993b); EH&A (1993a); EH&A (1993b); Ecoservices (1993); EH&A (1994); and SMA (1994). Island Botanics and SMA (1992) reported on a piping plover survey conducted for the EA for Permit No. 18344, an earlier version of the present project, and included the project areas footprint and an expanded area north of the project area between Zahn Road and Mustang Island State Park (MISP) and west of SH 361 (Expanded Area). A number of piping plovers were found near the project footprint near the turning basin, near SH 361, and in the MBHC and more were found in the washover passes and along Corpus Christi Bay, north of Packery Channel, in the Expanded Area. Over 15 days of observation in 1992 and 1994, Island Botanics and SMA (1992) and SMA (1994) reported on only 4 individuals on the Gulf Beach. EH&A (1994) surveyed the area from Zahn Road to MISP in 1993, the area included in the Expanded Area. Zonick and Ryan (1993a and b) reported on three seasons of observations in 1991-1993, all in the Expanded Area.

EH&A (1993a) reported on surveys at the Packery Marina site (located across Packery Channel due east of the MMPA), but the survey included some areas that overlapped with the Expanded Area. EH&A (1993b, 1994) were piping plover presence and roosting surveys, respectively, of the Commodore's Cove II site, located roughly one mile south of Packery Channel and 4,000 feet east of the GIWW. Results were 1-10 piping plovers per sighting and sightings during 30% of the observation periods, but no roosting piping plovers. Ecoservice (1993), reporting on a survey of The Village, located roughly 2,000 feet south of Packery Channel and 2,000 feet east of the GIWW, sighted piping plovers 38.5% of the time, at 1-26 birds per observation. The conclusions of the 1993 Biological Opinion were that the project proposed for Permit No. 18344 (01) would "not adversely affect the species to a measurable degree, and consequently...not jeopardize the further existence of the...piping plover."

In order to identify potential habitat within the bay system, the database supplied by Lee Elliott of the FWS, was superimposed on 1-meter color infrared digital orthophoto quarter quads (DOQQs)

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Figure 3

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were obtained from the TNRCC and available post-1996 aerial photography of the Corpus Christi Bay system. The database included all observations from surveys prior to the summer on 2000. The maps were taken to a meeting among FWS, TPWD, USACE, and PBS&J sites for the piping plover survey were selected. Rather than select areas where piping plovers had already been recorded and were known to use, four study sites with good habitat, but few/no records were selected by FWS and TPWD.

After coordination with the FWS, TPWD, and USACE, PBS&J conducted a piping plover survey in the Corpus Christi Bay area between September 2000 and April 2001 (PBS&J, 2001). Two of the four study sites, the Gulf Intracoastal Waterway (GIWW, which included GIWW PAs 172 and 173) and Fish Pass, fall within the northern portion of the Packery Channel study area. PA 174, or Rawalt Island, was not included in the survey at the recommendation of the FWS. The study sites were visited monthly. Altogether, 652 piping plovers were recorded at the GIWW study site in 185.6 hours of observation at a rate of 3.5 birds per hour. Many of these birds were undoubtedly seen on more than one occasion. The number of individuals at the GIWW site ranged from 27 in October 2000 to 182 in March 2001, while the number of birds encountered per hour ranged from 1.5 for October 2000 to 7.8 for March 2001. Thus, a minimum of 182 piping plovers utilized the GIWW study site during the 2000-2001 survey.

At the Fish Pass study site, 148 piping plovers were recorded during 122.8 hours of observation at a rate of 1.2 birds per hour. Apart from December 2000 when no piping plovers were recorded, the number of individuals ranged from 8 in November 2000 to 45 in March 2001, while the number of birds encountered per hour ranged from 0.6 for February 2001 to 3.4 for March 2001. Thus, at least 45 piping plovers utilized the Fish Pass study site. No surveys were conducted at the MBHC.

2.11.6 Effects of the Project

Based on modeling prepared for this project, a slight decrease in tidal range of approximately 0.04 to 0.09 feet will occur in Critical Habitat unit TX-6 as a result of opening Packery Channel. This may possibly result in slightly more tidal flat exposure, thereby increasing available foraging habitat to a minor degree. This effect is not certain and may not be detectable because of normal daily and seasonal variations. However, a monitoring study for MBHC has been coordinated among the FWS, TPWD, GLO, USACE, and the City of Corpus Christi, as described above, to determine possible impacts to the prey base of shorebirds, as well as changes in habitat. The impact of this effect on the piping plover, should it occur, is expected to be negligible. The change in tidal amplitude in Critical Habitat units TX-3 and TX-5, further south of the project site but within the general study area, will be approximately 0.01 foot or less, which is expected to result in no effect on these Critical Habitat units.

Impacts from salinity, based on modeling of the project, are relatively minor. With the opening of Packery Channel, salinity in the Laguna Madre, and thus within Critical Habitat units in the study area, is expected to fluctuate a few parts per thousand in the vicinity of the inlet with much smaller changes further from the project for each of the three salinity conditions modeled. Changes in salinity are not expected to be sufficient to affect the availability of invertebrate forage for piping plovers. More discussion regarding tidal amplitude and salinity modeling is found in the DEIS.

A portion of Critical Habitat (CH) unit TX-7 will also be directly impacted by both new construction and maintenance channel dredging, and dredged material placement in Placement Areas (PA) 4S and 4N, that are entirely or partially within TX-7. Approximately 1.5 acres of TX-7 will be permanently removed by channel and jetty construction (Figure 3). In addition, approximately 24.6 acres within CH unit TX-7 will be subject to periodic nourishment with sand from initial and maintenance dredging and from the sand bypass system. The 24.6 acres is the maximum area of CH that may be impacted during any single placement event and includes both north and south beach placement areas (PAs 4S and 4N) within CH unit TX-7. Depending on quantities, it is likely that either 4S or 4N rather than both PAs will be used for any single maintenance cycle. PA 4N (entirely in CH unit TX-7) is 19 acres in size and is proposed for maintenance placement only. PA 4S (partially within CH unit TX-7) is 27.1 acres in size and will be used for both initial placement during construction and for maintenance material. Although beach placement will affect CH, the value of the beach habitat will not be appreciably diminished. In fact, this beach nourishment is considered a beneficial use that will serve to counteract the current trend of erosion along this portion of the Gulf beach. Channel maintenance dredging and beach placement may occur on a one to three year interval depending on quantities. Disturbance from beach placement will result in displacement of any plovers in the area to more favorable habitats. Once disposal activities cease, stabilization of the beach by wave action and recruitment of forage invertebrates is expected to follow relatively quickly (Ray and Clarke, 2001). Were erosion to continue as it has in the past, portions of TX-7 could be permanently lost.

The effects of dredging and dredged material placement on the piping plover are expected to be minimal. In studies along the Lower Laguna Madre, Drake et al. (2000) found that overall usage of relatively undisturbed beach habitats by wintering piping plovers, including foraging and roosting, was minimal (2.8%). Piping plovers were found only to use beach habitats when other preferred habitats were unavailable, such as when algal and sand flats were inundated. This is considered to be partly due to the prime availability of forage on tidal flats and partly due to the high level of disturbance on beach habitats (Drake et al., 2000). The beach habitat within TX-7, identified as J.P. Luby Surf Park, is managed by the City of Corpus Christi and is subject to regular disturbance, including vehicle access and recreational beach activities. Because of the abundance of algal flats and sand flats in the adjacent critical habitat areas, paired with the heavy recreational and vehicular use of the beach areas in TX-7, potential impacts to piping plovers in TX-7 from dredging and dredged material placement are considered to be minor.

In summary, the project will result in permanent loss of 1.5 acres of CH for the piping plover. Direct impacts to plovers will result from construction activities and disposal of dredged maintenance material in PAs 4S and 4N, estimated to occur on a one to three year interval. It is estimated that over a 50-year project life, approximately 200,000 cy of material will accumulate annually for beach placement. The quantity and timing of specific maintenance episodes cannot be determined; however, it is estimated that beach placement will occur about once every two years. Both construction activities and placement of maintenance material are anticipated to have minimal impacts on the piping plover. Vehicle traffic will displace plovers causing them to take flight and fly to another suitable location. This displacement will be temporary. Piping plovers that may be present in the project area are already subjected to displacement by the public use of the existing park, and prime habitat is available a short

distance away in Mollie Beattie Habitat Community. There will be no impact to piping plover nesting, which does not occur in the project area.

2.11.7 Conservation Measures

Each maintenance project resulting in beach placement will be coordinated with the FWS to determine whether placement should occur in PA 4S or PA 4N. Two beach placement areas were designated so that there would be the flexibility to place maintenance material either north or south of the channel depending on rates of erosion. The location and timing of placement will be coordinated with FWS prior to placement. As discussed above, a MOU for MBHC has been negotiated for monitoring and potentially mitigating indirect project impacts to MBHC, which is located wholly within CH Unit TX-6.

2.11.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will affect critical habitat, but that it is not likely to adversely affect the continued existence of the piping plover.

FWS (1997), in consultation regarding a slightly earlier stage of the Packery Channel project, determined that the reopening of Packery Channel is unlikely to jeopardize the continued existence of the piping plover.

2.12 MOUNTAIN PLOVER

2.12.1 Reason for Status

The mountain plover (*Charadrius montanus*) was proposed for listing as a threatened species on 16 February 1999 (64 FR 7587). It appears to be declining rapidly. One study indicated recent population declines of 50% to 89%. The breeding distribution has also contracted, with both peripheral populations disappearing and core populations going from widely distributed to only locally present. Early declines were probably at least partly related to market hunting. Historically, many mountain plovers nested in prairie dog towns (NatureServe, 2000), which have declined 98% in landscape coverage since 1900 (Summers and Linder, 1978)

Conversion of shortgrass prairie to agricultural land, primarily for winter wheat, has destroyed nesting habitat, as has planting of taller grasses in native prairie. In the last 25 years, farms on the western Great Plains have become larger and different crops have become more popular. Many farmers now grow extensive crops of millet and sunflower, ironically partially for the birdseed market. Fields for these crops remain fallow until early May, after most mountain plovers have begun nesting, and many nests are destroyed by cultivation activities. The plovers are likely to renest in these fields after planting, only to be forced to abandon all the nests when the crops become too tall for the birds to scan their surroundings for predators. This major shift in regional activity has created a reproductive sink for mountain plovers, and may explain the annual decline since 1966 (Knopf, 1996). Encroachment on

native prairies by exotic species such as cheatgrass (*Bromus tectorum*), leafy spurge (*Euphorbia esula*), and knapweed (*Centaurea* spp.) may be a factor (NatureServe, 2000).

2.12.2 Habitat

The mountain plover, which actually avoids mountains, was originally named Rocky Mountain plover because the first specimens were taken within sight of that range. Instead, upland shortgrass plains and level plateaus of the western U.S. are its preferred summer haunts (Oberholser, 1974). Nesting areas are characterized by very short vegetation, and significant areas of bare ground (typically >30%), and flat or gentle slopes (<12%). Areas of moist ground are generally avoided, even for foraging. Non-breeding birds prefer short-grass plains and fields, plowed fields, sandy deserts (NatureServe, 2000), and sod farms (Knopf, 1996). They are attracted to heavily grazed annual grasslands and recent burns. Typical winter habitat in Texas is coastal prairies, alkaline flats, plowed fields, and bermudagrass fields (Oberholser, 1974). Mountain plovers are highly gregarious. Outside the breeding season they forage and roost in loose flocks of changing composition. Flock size may exceed 1,000 on the southern Great Plains in late summer. Mountain plovers may be attracted to cattle, sheep, and prairie dogs (NatureServe, 2000). No critical habitat has been designated for this species.

2.12.3 Range

The mountain plover's historical breeding range was northern Montana south to central New Mexico, western Texas, and western Oklahoma, with very low numbers in extreme southern Alberta and perhaps Saskatchewan. This species now breeds mainly in Colorado, Wyoming, and Montana. Recent sightings of birds in June and July in the vicinity of Saltillo, Nuevo Leon, may have been of breeding birds. The non-breeding range is central California, southern Arizona, and central and near-coastal Texas, south to southern Baja California and the northern mainland of Mexico to San Luis Potosi. The primary wintering grounds are now in the San Joaquin, Sacramento, and Imperial valleys of California (Knopf, 1996).

2.12.4 Distribution in Texas

The mountain plover is a rare summer resident in the high grasslands of the Trans-Pecos and in the northwest Panhandle. It is a rare migrant east to Delta County in the north and the Colorado River in central Texas. It is a rare to uncommon local winter resident on the coastal plains and inland from south Texas through the Edwards Plateau into the South Plains (TOS, 1995).

2.12.5 Presence in the Project Area

While the mountain plover has been recorded from Nueces County (Oberholser, 1974), it is most likely to occur in the agricultural areas away from the seashore. The mountain plover appears as an uncommon migrant on the checklist for birds of the Corpus Christi area (Audubon Outdoor Club of Corpus Christi (AOCCC), 1994), but is absent from checklists for Mustang Island State Park (Pulich et al., 1985) and PINS (SPMA, 1990). It is not expected to occur in the project area due to lack of suitable habitat.

2.12.6 Effects of the Project

The mountain plover is unlikely to occur in the project area and, thus, will not be affected by the proposed project.

2.12.7 Conservation Measures

Because no potential affects to the mountain plover will occur from the proposed project, no additional conservations measures are needed.

2.12.8 Conclusion

Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the mountain plover.

2.13 ESKIMO CURLEW

2.13.1 Reason for Status

The Eskimo curlew (*Numenius borealis*) was federally listed as endangered on 2 June 1970. It may be extinct; if not, it exists only in perilously low numbers. Only about 70 individuals have been seen anywhere in the last 60 years, and the last confirmed sighting of an Eskimo curlew was in Nebraska in 1987 (FWS, 1990a)

Eskimo curlews were extremely abundant in the nineteenth century and were subject to tremendous pressures from market hunting, especially after the demise of the passenger pigeon. They were held in high esteem as a food item, described by some as "the finest eating of any of our birds." Their abundance and tameness made supplying the demand an easy matter, and they were sold in restaurants and markets from Halifax to Buenos Aires. A pair of hunters on Cape Cod reportedly shot 5,000 curlews during the 1872 flight (Gollop et al., 1986). Market hunting for the Eskimo curlew flourished between 1860 and 1890, and was most intense during the late 1870s and 1890s in response to dwindling supplies of passenger pigeons (Gill et al., 1998).

Hunting was not the sole reason for the decline of the Eskimo curlew, for some population declines were noted several years before market hunting likely had significant impacts (Gill et al., 1998). This species was undoubtedly affected by habitat changes also. Over the last 125 years, a significant reduction has occurred in the amount and quality of habitat available to these birds along their migration routes. Urbanization and industrialization have impacted habitats on the Texas coast. Most of the grasslands used for spring migration feeding in the interior of North America have been converted to cropland. Most of the grassland on the pampas of Argentina have been converted to other uses and wet-meadow foraging habitat on Caribbean islands has been filled for tourism development. Pesticides and chemical contaminants are used widely in all but a few areas throughout the Eskimo curlew's range (FWS, 1990a).

Populations declined suddenly during the 1870s and by the 1890s they had effectively disappeared. Sightings during the first half of the twentieth century were very rare. Between 1945 and 1985, Eskimo curlews were reported in 23 different years, in numbers from 1 to 23 individuals (Gill et al., 1998)

The Eskimo curlew is a relatively long-lived bird with probably a low reproductive rate, and certainly a very long migration route on which it is exposed to a number of factors. Perhaps the most important of these factors, in conjunction with hunting pressures, was the conversion of native prairies to agriculture along its spring migratory route, along with the suppression of fires. These phenomena were related to the extinction of the Rocky Mountain grasshopper (*Melanoplus spretus*), whose localized population irruptions were important to migrating curlews.

The Eskimo curlew fed on various invertebrates, seeds and berries. Berries were the preferred food source during the boreal autumn before migration (Gill et al., 1998).

2.13.2 Habitat

The breeding habitat of the Eskimo curlew was treeless arctic and subarctic tundra (Gill et al., 1998). Non-breeding birds used a variety of habitats, such as grasslands, pastures, plowed fields, and, less frequently, marshes and mud flats (AOU, 1998). They favored headlands and hills within a few kilometers of the sea, and burned-over prairies and marshes were particularly attractive during migration. They roosted on beaches along the coast, but were rarely found near water in the midwestern states (Gollop et al., 1986). Critical habitat has not been designated for this species.

2.13.3 Range

The Eskimo curlew was only known to have nested in a relatively small portion of treeless tundra in the Northwest Territories, Canada, but the nesting range may have extended across northern Alaska into Siberia. They wintered in southern South America, primarily Argentina. Their fall migration took them eastward across Canada to the northeastern U.S., then southward across the Atlantic to South America. In spring they traveled through Texas and the midwestern U.S. (Gill et al., 1998).

2.13.4 Distribution in Texas

The Eskimo curlew was formerly extremely abundant on the prairies of Texas, particularly in the middle portion of the State. It occurred in immense flocks until about 1875 and was observable in small flocks until about 1900 (Oberholser, 1974). The few records in recent years are from Galveston Island (TOS, 1995).

2.13.5 Presence in the Project Area

Although the Eskimo curlew was formerly common in the spring in the Coastal Bend (Rappole and Blacklock, 1985), it is not expected to occur in the project area due to its extreme rarity, if not total extinction, and the lack of recent local records.

2.13.6 Effects of the Project

The Eskimo curlew is highly unlikely to be affected by this project due to the low probability of its occurrence in the area.

2.13.7 Conservation Measures

Because no potential affects to the Eskimo curlew will occur as a result of the proposed project, no additional conservation measures are needed.

2.13.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect the Eskimo curlew.

2.14 OCELOT

2.14.1 Reasons for Status

The ocelot (*Leopardus pardalis*) is listed as endangered throughout its present range (FWS, 1995, 2000c). Habitat destruction and degradation due to brush-clearing has been the major cause for the population decline, but predator control activities and hunting have also contributed. In Central and South America, exploitation for the fur and pet trade is primarily responsible for population declines (NFWL, 1980; FWS, 1995).

2.14.2 Habitat

The ocelot occupies a variety of habitats throughout its neotropical range including tropical and subtropical forests, riverine forests, swampy savannahs, estuarine mangroves, rocky areas, and upland oak forests (NFWL, 1980; Tewes and Schmidly, 1987; Murray and Gardner, 1997). In Texas, however, ocelots inhabit dense, often thorny and impenetrable brush, mesquite-oak and oak forests, and partially cleared land (NFWL, 1980; Navarro, 1985). Tewes (1986) found honey mesquite, acacias, condalia (*Condalia* spp.), allthorn goatbush (*Castella texana*), granjeno, cenizo, and whitebrush (*Aloysia texana*) to be the dominant brush species of ocelot habitat in south Texas. Approximately 1.6% of the land area in south Texas now supports this type of habitat (Tewes and Everett, 1987).

Tewes and Everett (1987) classified ocelot habitat in Texas according to the amount of foliar canopy. Class A or optimal habitat was 95% canopy cover, Class B or suboptimal habitat was 75% to 95% canopy cover, and Class C, with 75% or less canopy cover, was considered inadequate. The most Critical Habitat component is probably dense cover near the ground (<3 ft in height) (Tewes, 1986).

The ocelot is primarily nocturnal, although some diurnal activity has been recorded (Navarro, 1985; Tewes, 1986; Tewes and Schmidly, 1987). Navarro (1985) found ocelots in Texas to have two peaks of activity, one at about midnight and the other at daybreak. Ocelots feed on small and

medium-sized mammals such as woodrats (*Neotoma* spp.), rabbits (*Sylvilagus* spp.), young deer (*Odocoileus* spp.), nutria (*Myocastor coypus*), birds, reptiles, amphibians, fish, insects and, in Latin America, spider monkeys (*Ateles* sp.), coatis (*Nasua nasua*), and agoutis (*Agouti* sp.) (Hall and Dalquest, 1963; Guggisberg, 1975; Navarro, 1985; Tewes and Schmidly, 1987; Emmons, 1988).

While breeding occurs throughout the year in the tropics, it occurs primarily in the fall (September through November) in Texas, although births have also been recorded in April, June, July and August. Den sites are usually well hidden and include dense, thorny scrub, caves, hollows in trees or logs, and grass tussocks (Petrides et al., 1951; Navarro, 1985; Tewes, 1986; Laack and Rappole, 1986, 1987a; Tewes and Schmidly, 1987). Gestation is 70 to 80 days. Litter size ranges from two to four, with two being the most common. The mother provides extended parental care to the young because it takes time for them to become proficient at capturing prey. Males are believed to contribute little to direct parental care (Tewes, 1986). Ocelots in the wild become sexually mature at 16 to 18 months (Schauenberg, 1979), but in captivity, maturity may be reached in as little as 10 to 12 months.

Navarro (1985) found that the average home range (the area which an animal occupies during its normal daily activities) for three male ocelots in south Texas was 618 acres, and for one female was 519 acres. Similarly, Twedt and Rappole (1986) reported home ranges of 865 and 296 acres for two male ocelots on Yturria Ranch in Willacy and Kenedy counties. However, Tewes (1986), using a much larger database, found the average home range of south Texas ocelots to be 4,372 acres for males and 2,717 acres for females. The overall average for adults was 3,754 acres. Although male ocelots had larger territories than the females and generally covered an extensive area in a short period, females used the home range more intensively (Tewes, 1986; FWS, 1990b). Tewes (1986) also determined that home ranges expanded in the winter and contracted in the summer. Both Navarro (1985) and Tewes (1986) found little overlap in the home ranges of adjacent males, but quite a considerable intersexual spatial overlap in the home ranges. Tewes and Schmidly (1987) and Navarro (1985) also found that the home ranges were closely aligned with the amount of suitable available habitat. At Laguna Atascosa NWR, for example, an increase in the ocelot population has resulted in smaller home ranges, two ocelots occupying an area that had previously supported only one (Tewes, 1988). Some individuals there currently inhabit areas as small as 80 acres (Tewes, 1988). Critical habitat has not been designated for this species.

2.14.3 Range

Historically, the ocelot occurred in Arkansas, Arizona, southern California, and south through Central and South America to Peru, Uruguay and northern Argentina (Navarro, 1985). Today it ranges from Arizona and Texas through Central and South America to northern Argentina, but in reduced numbers (Tewes and Everett, 1987; Emmons, 1990; Murray and Gardner, 1997).

2.14.4 Distribution in Texas

The ocelot once occurred in the eastern, central and southern portions of Texas but currently only exists in the extreme south of the State (Davis and Schmidly, 1994). As a first step to

determining the status of the ocelot in Texas, a clearinghouse for ocelot (and jaguarundi) sightings was established in October 1981 to coordinate reception and filing of reports. A total of 1,572 questionnaires was mailed to trappers to obtain additional information; of these, 472 (30%) were returned and 87 (6%) contained positive responses (Tewes and Everett, 1987). From these results, it appears that two significant populations of ocelots exist in south Texas. One population inhabits parts of Hidalgo, Starr, Cameron, and Willacy counties, and the other, Jim Wells, Live Oak, McMullen and Atascosa counties. Six or seven smaller populations may also occur. Based on studies of spatial patterns and densities of radio-collared ocelots, Tewes (1986) estimated that only 80 to 120 ocelots occur in Texas. Laack (1998) currently puts this number at 100. A population of approximately 30 to 40 ocelots occurs on the Laguna Atascosa NWR in Cameron County (Laack, 1998). One or two ocelots apparently occur at the Santa Ana NWR (Benn, 1997; Laack, 1998) and one pair of ocelots had territories near the Arroyo Colorado in Cameron County (Laack, 1998). Ocelots have been sighted at the NAS's Sabal Palm Grove Sanctuary (Homerstad, 1986); and at the Loma de Grulla complex north of Laguna Vista, at Moranco Blanco, and at Redhead Ridge (Tewes, 1987). Ocelot sightings have also been reported from the Lower Rio Grande Valley NWR. In addition, Laack and Rappole (1986, 1987a), Tewes (1987) and Homerstad (1987) have documented several other ocelot sightings in Cameron County. The closest ocelot population in Mexico is near San Fernando, approximately 100 miles south of the U.S.-Mexico border (Laack, 1998).

2.14.5 Presence in the Project Area

Ocelots are highly unlikely to occur in the project area due to the lack of suitable brushy habitat.

2.14.6 Effects of the Project

No impacts to the ocelot are expected from this project as it is unlikely to occur in the project area due to the lack of suitable brushy habitat. Due to the rarity of this species, no direct or indirect effects to the species will occur.

2.14.7 Conservation Measures

Because no potential affects to the ocelot will occur from this proposed project, no additional conservation measures are needed.

2.14.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect the ocelot.

2.15 JAGUARUNDI

2.15.1 Reasons for Status

The jaguarundi (*Herpailurus yagouaroundi*) was listed by FWS as endangered on 14 June 1976 (41 FR 24064). Habitat loss and alteration due to brush-clearing activities, and human persecution are the main causes for the decline in jaguarundi populations (FWS, 1995).

2.15.2 Habitat

Habitat requirements in Texas are similar to those for the ocelot: thick, dense thorny brushlands or chaparral. Approximately 1.6% of the land area in south Texas is this type of habitat (Tewes and Everett, 1987). The thickets do not have to be continuous but may be interspersed with clear areas. Jaguarundis possibly show a preference for habitat near streams (Goodwyn, 1970; Davis and Schmidly, 1994). In South America, habitat includes high mountain forests, tropical forests, swamp forests, savannahs, overgrown pastures, and thickets (NFWL, 1980; Tewes and Schmidly, 1987).

The most common plants occurring in habitats in the Rio Grande Valley where the jaguarundi is known to occur are huisache, blackbrush acacia, prairie baccharis (*Baccharis texana*), chillipiquin (*Capsicum annuum*), lotebush, allthorn goatbush, Texas persimmon (*Diospyros texana*), coyotillo (*Karwinskia humboldtiana*), common lantana (*Lantana horrida*), berlandier wolfberry (*Lycium berlandieri*), javelinabrush (*Microrhamnus ericoides*), Texas pricklypear (*Opuntia lindheimeri*), retama, honey mesquite, cedar elm (*Ulmus crassifolia*), and lime pricklyash (*Zanthoxylum fagara*) (Goodwyn, 1970).

Jaguarundis have two distinct color phases, red and gray, although the latter phase has also been called blue. The phases are so distinct that at one time they were thought to be separate species, the red one being called *Felis eyra*. A third color phase, black, has also been reported, but apparently does not occur in Texas (Goodwyn, 1970).

Like the ocelot, the jaguarundi is primarily nocturnal, although some diurnal activity has been recorded. Jaguarundis are excellent climbers although they spend most of the time on the ground. Prey is largely birds, but bird eggs, rats, mice, rabbits, reptiles and fish are also taken (Goodwyn 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Jaguarundis communicate by calls, of which 13 have been identified in captive animals. The largest repertoire occurs during the mating season (Hulley, 1976).

Little is known of jaguarundi reproduction in the wild. Den sites include dense thickets, hollow trees, spaces under fallen logs overgrown with vegetation, and ditches overgrown with shrubs (Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Young have been born in March and August with possibly two litters per year. Usually 2 to 4 young comprise a litter, with litters being either all of one color phase or containing both the red and gray phases. Gestation (for captive jaguarundis) varies from 63 to 75 days (Goodwyn, 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994). No critical habitat has been designated for this species.

2.15.3 Range

The jaguarundi historically occurred in southeast Arizona, south Texas, and Central and South America as far south as northern Argentina. Today this cat has a similar distribution, but in much reduced numbers, although it probably no longer occurs in Arizona (Tewes and Schmidly, 1987). The presence of jaguarundis in Florida is likely the result of human introduction (Nowak and Paradiso, 1983).

Four North American subspecies are recognized, of which two occur in the U.S.: *H.y. cacomitli* from southern Texas to central Vera Cruz, Mexico, and *H.y. tolteca* from southern Arizona, along the Pacific coast of Mexico, and inland to the Mexican Plateau (Goodwyn, 1970; NFWL, 1980).

2.15.4 Distribution in Texas

Tewes and Everett (1987) analyzed the records of a clearinghouse established in 1981 to coordinate reception and filing of reports of jaguarundis (and ocelots) in Texas. Many of the reports were solicited by sending out questionnaires to trappers. Jaguarundis were reported from central Texas and the upper Gulf coast as well as from south Texas. However, due especially to the lack of any tangible evidence such as road kills, most of the sightings in the first two areas are believed to have been of black feral house cats. Two dead jaguarundis were reported in Cameron County and one each in Willacy and Webb counties. Tewes (1987) and Tewes and Everett (1987) documented several other credible reports of jaguarundis in these three counties. One of these was of a road-killed male jaguarundi found near the junction of SH 4 and Farm-to-Market Road (FM) 511 (Kellers Corner) in Cameron County on 21 April 1986 (Tewes, 1987; Laack and Rappole, 1987b). While this was the last confirmed record of a jaguarundi in Texas (Laack, 1998), unconfirmed jaguarundi sightings in Hidalgo County include Bentsen Rio Grande State Park, Santa Ana NWR, Lower Rio Grande Valley NWR, Cimarron Country Club, Wimberley Ranch, and the Anacua Unit of the TPWD Las Palomas Wildlife Management Area (Prieto, 1990, 1991; Benn, 1997). Unconfirmed but reliable sightings of a jaguarundi occurred at the Sabal Palm Grove Sanctuary in Cameron County in 1988 (Anonymous, 1989). Recent jaguarundi sightings have been reported from the Santa Ana NWR for March 1998 (Santa Ana NWR data). Based upon sighting reports, personnel of the Santa Ana NWR suspect the presence of jaguarundis on the refuge (Benn, 1997).

Tewes and Everett (1987) concluded that until verifiable evidence of jaguarundis from central Texas and the upper Gulf coast was forthcoming, jaguarundi distribution in Texas should be considered as restricted to the Rio Grande Valley. The number of jaguarundis in Texas is unknown, but certainly less than that of ocelots.

2.15.5 Presence in the Project Area

Jaguarundis are extremely unlikely to occur in the project area due to the lack of suitable brushy habitat and the lack of any known populations in the area.

2.15.6 Effects of the Project

No impacts to the jaguarundi are expected from this project as it is unlikely to occur in the project area due to the lack of suitable brushy habitat and the lack of any known populations in the area. Due to the rarity of this species, no direct or indirect effects to the species will occur.

2.15.7 Conservation Measures

Because no potential affects to the jaguarundi will occur from this proposed project, no additional conservation measures are needed.

2.15.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect the jaguarundi.

2.16 WEST INDIAN MANATEE

2.16.1 Reasons for Status

The West Indian manatee (*Trichechus manatus*) was listed as endangered on 2 June 1970 (35 FR 8495). The largest known human-related cause of manatee mortality in Florida is collisions with hulls and/or propellers of boats and ships. The second-largest human-related cause of mortality in Florida is entrapment in floodgates and navigation locks. Other known causes of human-related manatee mortality include poaching and vandalism, entrapment in shrimp nets and other fishing gear, entrapment in water pipes, and ingestion of marine debris (FWS, 1993). Hunting and fishing pressures were responsible for much of its original decline, as manatees were heavily hunted for meat, hides, and bones until they were nearly extirpated (FWS, 1995).

A prominent cause of natural mortality in some years in Florida is cold stress, and major die-offs associated with the outbreaks of red tide have occurred, where manatees appear to have died due to ingestion of filter-feeding tunicates that had accumulated the neurotoxin-producing dinoflagellates responsible for causing the red tide (FWS, 1993). The low reproductive rate and habitat loss make it difficult for manatee populations to recover.

2.16.2 Habitat

The manatee inhabits shallow coastal waters, estuaries, bays, rivers, and lakes. Throughout most of its range it appears to prefer rivers and estuaries to marine habitats, although manatees inhabit marine habitats in the Greater Antilles (Lefebvre et al., 1989). It is not averse to traveling through dredged canals or using quiet marinas. Manatees are apparently not able to tolerate prolonged exposure to water colder than 20°C. In the northern portions of their range during October through April they congregate in warmer water bodies, such as spring-fed rivers and outfalls from power

plants. They prefer waters that are at least 3.3 to 6.6 ft in depth; along coasts they are often in water 9.9 to 16.5 ft deep. They usually avoid areas with strong currents (NatureServe, 2000).

Manatees are primarily dependent upon submergent, emergent, and floating vegetation, with the diet varying according to plant availability. They may opportunistically eat other foods such as acorns in early winter in Florida or fish caught in gill nets in Jamaica (O'Shea and Ludlow, 1992). Critical habitat for this species has not been designated.

2.16.3 Range

The manatee ranges from the southeastern U.S. and coastal regions of the Gulf of Mexico, through the West Indies and Caribbean, to northern South America. U.S. populations occur primarily in Florida (NatureServe, 2000), where they are effectively isolated from other populations by the cooler waters of the northern Gulf of Mexico and the deeper waters of the Straits of Florida (Domning and Hayek, 1986).

2.16.4 Distribution in Texas

Manatees are extremely rare in Texas, although in the late 1800s they apparently were not uncommon in the Laguna Madre. Recent Texas records also include specimens from Cameron, Galveston, Matagorda, and Willacy counties (FWS, 1995). Davis and Schmidly (1994) describe a Texas record of a manatee found dead in the surf near the Bolivar Peninsula near Galveston. Manatees may travel great distances (200 km or more) along the coast or between islands (FWS, 1995).

2.16.5 Presence in the Project Area

Albert Oswald of the Texas State Aquarium spotted a manatee in the inlet between the Texas State Aquarium and the Lexington Museum on 23 September 2001. This is the third and probably most reliable sighting of the manatee in Corpus Christi Bay (Beaver, 2001). A manatee was also sighted recently in the intake canal of the Barney Davis Power Plant, roughly 4.4 miles from the junction of Packery Channel and the GIWW.

2.16.6 Effects of the Project

While the West Indian manatee has been recently sighted in Corpus Christi Bay, such occurrences are extremely rare. Due to the rarity of this species, no direct or indirect effects to the species will occur.

2.16.7 Conservation Measures

Because no potential affects to the West Indian manatee will occur from this proposed project, no additional conservation measures are needed.

2.16.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect the West Indian manatee.

2.17 WHALES

Whales occur in offshore waters and will not be impacted by the proposed dredging and opening of Packery Channel. The channel does not extend out into deeper waters where whales are likely to occur.

2.17.1 Conservation Measures

Because no potential affects to whales will occur from this proposed project, no additional conservation measures are needed.

2.17.2 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project is not likely to adversely affect whales.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

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February 12, 2003

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Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
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Cons.# 2-11-02-F-255

Dear Dr. Saunders:

This document transmits the U.S. Fish and Wildlife Service's (Service) Final biological opinion based on our review of the proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel) (PL 106-53) located in Nueces County, Texas, and its effects on the Kemp's ridley sea turtle (*Lepidochelys kempii*), green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*) and the piping plover (*Charadrius melodus*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. § 1531 et seq.). We received your letter dated January 22, 2003 requesting formal consultation on January 24, 2003.

This biological opinion is based on information provided in the Final Revised Biological Assessment (BA), received by the Service January 24, 2003, for impacts to Endangered and Threatened Species Relative to the North Padre Island Storm Damage Reduction and Environmental Restoration Project, Nueces County, Texas, Packery Channel Minerals Management Placement Area Dredge Site Alignments, Memorandum of Understanding (MOU) Regarding the Monitoring of Mollie Beattie Coastal Habitat Community (MBCHC), a June 2002 Draft BA, supplemental information to the BA, the June 2002 Draft Environmental Impact Statement (DEIS), project proposal, available literature, personal communications with U.S. Army Corps of Engineers (COE) staff and contracted consultants from PBS&J, field investigations, and other sources of information. A complete record of this consultation is on file in the Corpus Christi, Ecological Services Field Office in Corpus Christi, Texas.

Consultation History

On August 1, 1994, the Service issued a biological opinion (2-11-92-F-024) on the proposed issuance of Section 10/404 Permit Number 18344(01) to Fish Trackers/Reopen Packery Channel

Association. The local sponsor proposed to reopen and maintain Packery Channel, however, the proposed project was not constructed.

The currently proposed project is sponsored by the City of Corpus Christi (City) and was directed by Congress under the WRDA 1999 CPL 106-53 (Section 556 entitled "North Padre Island Storm Damage Reduction and Environmental Restoration Project") and the purpose and justification has been established by Congress. The history of consultation for the currently proposed project (2-11-02-F-255) is as follows:

- Nov. 26, 1997 The Service responds to a Congressional Inquiry from the Office of Senator Phil Gramm regarding the reopening of Packery Channel.
- April 20, 1999 House of Representative (H.R.) Bill 1480 authorized the construction of Packery Channel and financing was awarded under the Water Resource Development Act of 1986.
- Aug. 17, 2000 The COE announces a Notice of Studies and Initial Public Scoping Meeting for Packery Channel-North Padre Island Storm Damage Reduction and Environmental Restoration Project, Corpus Christi, TX. Meeting is set for September 17, 2000, 7-9:00 p.m. at the Bayfront Convention Center.
- Sept. 17, 2000 Public Scoping Meeting held at Bayfront Convention Center.
- Aug. 7, 2001 The COE announced to resource agencies that it had been authorized by Congress to prepare a EIS for the Packery Channel Project.
- April 18, 2002 The Service received an invitation to attend the Nueces County Beach Management Advisory Committee Packery Channel Dune Protection Permit Meeting scheduled for 4:00 p.m. The meeting was to include a presentation by the City of Corpus Christi staff on the permit, a site visit, and final recommendation by the Committee to the Nueces County Commissioner's Court on approval recommendations for the permit.
- May 22, 2002 The COE requests clarification of the piping plover critical habitat unit TX-7 southern boundary. There was a difference between the Federal Register Proposed Rules of 7/6/2000 which identified Zahn Road to be part of the boundary and the Final Rules of 7/10/2001 which changed it to St. Bartholomew Avenue. The Service responded that the final rule was correct.
- May 31, 2002 The Service sent an email to the COE requesting status update on the Draft Packery EIS.
- June 18, 2002 The DEIS and draft BA are received in our office.

- June 27, 2002 The COE requested a resource agency meeting, via email, for the Packery Channel project prior to the scheduled July 18, 2002 public meeting to discuss the DEIS and the MBCHC.
- July 2, 2002 The COE, via email, expressed their intention to discuss the project mitigation plans. The DEIS proposed mitigation addressed seagrasses and dunes but not marsh mitigation. They were hoping to work out ratios and potential locations of mitigation for these resources at the July 8th resource agency meeting. The COE also intended to discuss TGLO's request to identify beneficial use areas in addition to beach placement if possible. They expected to work with the MBCHC management team and wanted to be prepared to address any issues identified for endangered species.
- July 8, 2002 A meeting between all resource agencies, the COE, COE's consultants, and City of Corpus Christi (City) was held to answer questions on the DEIS and Mitigation Plan. Some points discussed were: 1) After initial construction maintenance of Packery Channel and beach renourishment would be performed by the City. 2) Channel dredge material would be sand and a majority would be placed on the beach. 3) There would be a pipe placed under the jetties to access dredging and renourishment projects. 4) Impact would be out to the third sandbar. 5) The Executive Summary of the DEIS (USACE, 2002, USACE, 2003) identified that 1.5 acres of piping plover critical habitat would be permanently removed, 24.6 acres of beach would be renourished, the project area is in critical habitat unit TX-7, a beach conducive to turtle nesting and potentially could increase the chance of turtle mortality from increased traffic and vehicle strikes. Questions were raised regarding the accuracy of resource data and methodology. The COE and City was notified the southern boundary of the MBCHC was incorrectly identified in the DEIS, and therefore, a portion of the proposed Packery Channel was actually located within the MBCHC site.
- July 10, 2002 Since several issues were raised at the July 8th meeting concerning the accuracy of the resource data, the COE was concerned and believed it was important to resolve those issues at the scheduled July 11th modeling meeting. Until then, they intended to proceed with the consultant's data as accurately reflecting the resources present and providing the basis for reporting impacts and calculating mitigation ratios.
- July 11, 2002 A meeting between the COE, resource agencies, COE's consultants and the City was held to discuss development information provided by the City and the consultant's modeling efforts to date. The City reported a total of 154,881 acres were on public and private lands on Mustang and Padre Islands, between the Corpus Christi Ship Channel and Port Mansfield Channel. They reported 139,691 acres (90.2%) of all lands were in public trust and 9,964 acres of

private lands north of the Mustang State Park and outside Coastal Barrier Resource Act (COBRA), and 3,243 acres of private lands south of the State Park outside of COBRA (8.5%). They also reported private land within COBRA totaled 1,983 acres (1.3%). Therefore they believed 90.2% of the total was within the public trust and could not be developed.

The consultants used the Texas Water Development Board grid system model and modified it to include alternatives and Packery. They looked at intertidal (influx) amplitude, and started with a base condition and compared it to each alternative. Questions were raised as to whether the worse case scenario could be modeled, hydraulic resistance, channel width, wind and gulf influx, inundation, tidal drive, sensitivity analysis and simulation of a tropical storm within the channel. The consultant's analysis showed there would be very little change in tidal regime. The group selected 11 nodes for a timed series for tidal influx and velocity with and without Packery. The model would be run again with the nodes selected and the COE would provide new data.

The MBCHC team requested time to meet and discuss management and the information that was provided. Additional discussions were held on the consultant's field work involving seagrass beds. The group made plans to go to the field later in the day and review methodology.

After the meeting, the COE, consultants and the City met at the Service's office to discuss endangered species and consultation issues. The consultation process was discussed. We recommended formal consultation because of permanent loss of 1.5 acres of piping plover critical habitat and periodic disturbance of piping plover and nesting sea turtle habitat. The critical habitat designation only added an additional adverse modification analysis the Service was required to make. The Service was also concerned about the impacts to MBCHC. The Service recommended revisions to the BA and the COE decided to revise the BA and resubmit it for review.

The City requested an expedited consultation due to funding issues. The Service acknowledged that request and stated it would do all that was possible to fulfill their request once we had received the necessary information from the COE in the form of their revised BA and accepted it as containing the necessary information to complete the biological opinion.

July 19, 2002 The COE, COE's consultants, and the Service met to discuss the new modeling results from the 11 nodes chosen by the Service and other resource agencies. Comparisons were made of tide elevation with constant wind and diurnal wind, time series of simulated tide elevation with and without Packery Channel, time series of simulated eastward velocity with and without Packery Channel, time

series of simulated northward velocity with and without Packery Channel, comparison of eastward velocity with constant wind and diurnal wind, comparison of tide elevation with and without Packery Channel, comparison of eastward velocity with constant wind and diurnal wind, comparison of eastward velocity with and without Packery Channel, comparison of northward velocity with constant wind and diurnal wind, comparison of northward velocity with and without Packery Channel. The results of an important node, # 5401 were not available. The consultants stated it took about 5 days to bring the model to equilibrium because it was dominated by the Corpus Christi Bay. They still reported little change, however the Service believed that these small differences could be significant because of the flat nature of the landscape. The Service requested the COE take the calibrated model and apply it to real tidal change and forward the results of node #5401 to our office. The COE agreed to run the model if possible.

- July 25, 2002 The COE's consultant emailed the results of the Packery model with real tide and wind. The 2000 series nodes were part of the existing model and the 5000 series were nodes that were added to represent Packery Channel. Figure 2 represented the tide elevations for each node and Figure 3 showed the wind field. For the month of August 1991 the maximum tide range for the month was 2.7 feet while the minimum range was less than a foot. For the most part the winds appeared to be SSE peaking at around 20 mph. The tide range got smaller as one moved inland. By the time it reached node 5197, the middle of the 7-ft deep channel, the peak tide range dropped to less than 2 feet and by node 5224, nearing the Packery Channel County Park, the peak tide range was less than a foot.

- July 29, 2002 COE's consultant notified the Service of a typographical error on the modeling results. The Service also received a copy of the Texas General Land Office's (TGLO) comments on the proposed project DEIS.

- Aug. 2, 2002 The Service sent initial comment letter on DEIS and BA to COE

- Aug. 22, 2002 MBCHC Management Team [Service, Texas Parks and Wildlife Department (TPWD), Texas General Land Office (TGLO), National Marine Fisheries (NMFS) and Texas Audubon Society (Audubon)] sends comment letter on DEIS to COE.

- Sept. 3, 2002 The COE invited the Service to attend the MBCHC meeting scheduled for the next day to discuss modeling issues.

- Sept. 4, 2002 MBCHC Management Team meets with COE and the City of Corpus Christi to discuss monitoring requirements. The Service meets with COE's consultants,

COE and the City to discuss the BA deficiencies and clarify the biological opinion process. The COE made the decision to continue to revise the BA and resubmit it to the Service for review. The COE anticipated having it back to us in one week.

Sept. 10, 2002 The COE requests information, via email, on piping plover and turtle nesting season windows. The Service provided the information by the end of the day. The Service made recommendations and identified dates piping plovers would be present during winter use and fall migration. The Service also made recommendations on staging, and in particular requested no staging be done at Newport Pass, as it is an area with unusually large concentrations of piping plovers and other migratory birds. Recommendations were provided on beach placement areas and the work be coordinated with the Service. The Service provided recommendations on nesting sea turtles, other minimization measures, and identified the best project window to coordinate work would be during the timeframe of October 15 through March 15 to avoid impacts to sea turtles. Although piping plovers would still be present during that timeframe the piping plovers would have been here long enough to build their energy reserves prior to spring migration which make them less susceptible to energy depletion.

The Service received revised draft BA from the COE for our review, but the COE does not request initiation, prefers to wait until the Service had a chance to review. The Service requested a copy of PBS&J's 2001 piping and snowy plover survey of the Corpus Christi Ship Channel Project, the consultants had not provided one for the Service to review. The COE could not locate a copy, and was to request a copy from the consultants.

Sept. 11, 2002 Service receives final modeling data from consultants on behalf of COE. According to what Paul Jenson of PBS&J, COE's consultant, explained in his email, the runs were similar to what was provided on July 25th with real tides and winds for August 1991. The difference was that Dr. Lee had modified the "w/o Packery" model to include the exiting parts of the Packery Channel that were not part of the channel in the "w/Packery" model. With that change there were actual with and without comparisons for this locations. He further stated that Figure 2, attached to his response, started in the north with the same general pattern of a phase shift in the tide resulting in a small decrease in tidal amplitude. Cells 2660 and 2837 showed this most strongly. The next one down, cell 5401, showed less of an amplitude drop but still a big phase shift. As he described it "It is "feeling" the influence of the gulf tide with Packery Channel." Going down the existing PC channel to 5224, the phase shift is even stronger. Moving down more to 5197, the influence of the Gulf tide is clear. Where in the w/o Packery Channel situation this station is part of a dead-end canal with small tide range, it now has the Gulf tide driving the train. The same

is true for 5241, which is essentially the end of the existing Packery Channel. These stations would experience a major change in their tidal regimes and in the tidal currents. Station 5340 does not exist without Packery Channel, and there is no change in the Gulf tide shown by 5366. His Figure 3 showed the wind files with no change from the July 25th transmittal.

The same day, the Service sought technical expertise from Dr. Kim Withers at Texas A&M at Corpus Christi regarding the modeling runs and its potential effect to piping plovers. Her review stated that it appeared water would be moving faster and two possible effects would be: 1) increased tidal scour and the potential for tidal flats to either not be inundated at all or have more frequent inundation and less exposure of the tidal flats 2) decreased amplitude, flats could not be inundated frequently enough or long enough for invertebrate communities to become well established and 3) increased amplitude could cause a narrowing of the area available for plover foraging and could result in a fairly substantial reduction of the drier areas. She clarified that "this is not to say that decreased amplitude would result in increased habitat availability since without flooding to provide recruits and sustain the inverts, there will not be suitable habitat". She further stated that another consideration with shorebirds is the high degree of site fidelity they exhibit. Although there may be other suitable habitats available, it is not established that shorebirds are necessarily able to change their behavior and move to other areas, even when these areas provide equivalent or equal resources.

Sept. 12, 2002 The Service was concerned about impacts to MBCHC and requested from the COE clarification on interpretation of new modeling data. It appeared the new model runs indicated a major change in the tidal regimes and in tidal currents and requested clarification on 5 points: 1) What is the area in acres that will be covered during high tide events that is not now generally inundated by high tides? Does this include any areas now designated as tidal flats? If possible please highlight these areas on a map. 2) What is the area in acres that will be exposed during low tide events that is not now generally inundated by low tides? Does this include any areas now designated as seagrass areas? If possible please highlight the areas on a map. 3) Can you estimate the change in velocity of the water during tide phase changes from your model data? If so, what are the estimated velocities. 4) Does the model with Packery Channel model a change like "dredged with bulkheads in place" or "without any reinforcement structures? 5) Will the draft EIS reflect these new model runs results.

Sept. 13, 2002 The COE contacted the Service to offer any assistance in answering further questions that may arise. At that time the Service was only awaiting a response to the above questions discussed on September 12th, and inquired as to when we

may be receiving a response to those questions. The COE replied via email they would be calling the Service Monday 9/16 or Tuesday 9/17/02.

Sept. 17, 2002 The Service provides 7 comments to COE in a telephone conversation concerning the draft BA. Some of the changes discussed were: 1) "may affect" and "jeopardize and take" wording,, 2) 2001 survey season figures for turtles not included in the species section, 3) possible increased seagrass impacts with new model runs, 4) citations on surveys they discuss in the BA, 5) the need to include the new model runs and results or conclusions in the draft or final BA and in the Final EIS, 6) information on the recolonization of invertebrates for piping plover and cite, and a possible typographical error when describing the acres of critical habitat to be impacted.

The Service was still awaiting a response on the September 12th questions and reasoned the inclusion of the new modeling results would require the most time for the COE to include in the Final BA. The COE responded via email requesting a conference call at 3:00 on 9/18/02. The Service emailed the COE and confirmed the time and date would be acceptable.

Sept. 18, 2002 Service participated in a conference call with COE, the City and the COE's consultants regarding the modeling data. The COE was unable to answer September 12th questions 1 and 2 unless the Service or someone could provide them with slope of land information. They offered to fax us the Dames and Moore Report as a result of question #3; #4, the model has bulkheads in it since the channel has vertical sidewalls and #5, the new final EIS will reflect the new information provided by the model. The Service expressed concern that the new model results appeared to show major changes in tidal regimes and in tidal currents. The consultants stated the model results did show a major change, but they were of the opinion that it was an exaggeration of the facts and did not reflect "real world". The Service recommended the new model results be included in the revised BA and carefully explain why it would not occur as the model showed. They agreed.

Sept. 19, 2002 Service receives The Erosion Project Design for the Packery Channel Project from COE, prepared for them by URS Corporation in March 2002. The Service and the COE discussed the fact that the COE regulations specifically required that all endangered species coordination be resolved and presented in the FEIS.

Sept. 24, 2002 MBCHC Management Team meets with COE and City to discuss draft monitoring plan.

Oct. 2, 2002 The Service requested via email a possible date from the COE as to when the revised final BA would be available to enable the Service to attempt to meet the

- November 1st deadline for the Service's biological opinion requested by the City. The COE was still resolving issues with the project mitigation plan and the MBCHC but hoped to issue the final BA by early the following week.
- Oct. 31, 2002 The Service coordinated and requested input from the U.S. Geological Survey's (USGS) Sea Turtle Coordinator, Donna Shaver, on the project and measures that could help minimize impacts to nesting sea turtles.
- Nov. 3, 2002 The USGS Sea Turtle Coordinator provided comments on various measures.
- Jan. 23, 2003 The COE notified the Service the Final BA was federal expressed to the Corpus Christi office and would also be providing an electronic copy for Service use.
- Jan. 24, 2003 Final BA was received from COE. Also included were the City of Corpus Christi Packery Channel MMPA Dredge Site Alignments, revised description of the proposed action to be included in the DEIS, MOU regarding the monitoring of the MBCHC.
- Feb. 3, 2003 The Service sends the COE an email with several questions on the Final BA that still need to be resolved or clarified regarding the total acreage of piping plover and nesting sea turtle habitat and piping plover critical habitat being directly or indirectly impacted, timing of project, windows of time to avoid or minimize impacts to species, the MBCHC MOU, Aids to Navigation Team and the new MMPA site.
- Feb. 4, 2003 The COE responded to the Service the email had been received and would provide us with answers to our questions the next day February 5, 2002.
- Feb. 5, 2003 The COE provided the Service, via email, answers to all 10 questions the Service had requested and could provide us with any maps necessary. The Service acknowledged receipt of their correspondence via email.
- Feb. 6, 2002 The Service requested the COE electronically provide us with two maps and a figure, 1) a map that delineated the 1.5 acres of critical habitat to be permanently lost and 2) a map delineating the 24.6 acres of critical habitat in PA 4N and PA 4S 3) Figure 1-2 Proposed Packery Channel and Placement areas that correctly identified the location of the MMPA site.
- Feb. 7, 2002 The Service requested the COE provide additional figures electronically or per CD. The figures were: 1-2, 3.4-2a, 3.4-2b, 3.4-2c, 3.4-2d, 3.4-2e, 3.6-1 and 4.11-1a. The Service also reiterated to the COE that it was making every possible effort possible to assist the COE and the City in expediting the biological opinion in an attempt to meet the requested February 12th date.

Feb. 11, 2003 The Service sends Draft biological opinion to the COE.

Feb. 12, 2003 The Service received comments from the COE and the City. The Service finalizes the BO and issues the Final Biological Opinion to the COE.

Regarding the Service's piping plover critical habitat destruction or adverse modification determination:

On March 15, 2001, in a case involving the prudence of designating critical habitat for the Gulf sturgeon (*Sierra Club v. U. S. Fish and Wildlife Service et al.* (CA NO. 98-3788-K-2 E. D. La.)), the Fifth Circuit Court of Appeals ruled that the Services' current definition of "destruction or adverse modification" of critical habitat was not valid. The Court reasoned that the Act defined critical habitat as areas which are essential to the conservation of the species; that conservation is a broader concept than mere survival and is defined in the Act as speaking to the recovery of a species. Therefore, we had erred in defining destruction or adverse modification in terms of both survival and recovery. Therefore, in evaluating whether the effects of this proposed action constitute destruction or adverse modification of critical habitat, we analyze whether the effects appreciably diminish the value of the critical habitat for the recovery of the species.

BIOLOGICAL OPINION

I. Description of the Proposed Action

A. Purpose of Project and Location

Purpose

The proposed project is the construction and reopening of Packery Channel. The construction will provide a dredged channel across North Padre Island between the Upper Laguna Madre and the Gulf of Mexico. The DEIS (USACE, 2002) states the purpose of the proposed project is "to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island, Corpus Christi, Texas." On April 20, 1999, H.R. 1480, Sec. 556, (a) authorized the Secretary (of the Army) to construct a navigation and storm protection project at Packery Channel, Mustang Island, Texas. The construction would consist of a channel, jetties and placement of sand along the length of the seawall. Section 556 (b) stated "in evaluating the project, the Secretary shall include the ecological and recreational benefits of reopening the Packery Channel.

The project was to be financed in accordance with section 903(c) of the Water Resources Development Act of 1986 (100 SAT. 4184) and the WRDA 1999 Sec. 556 has a slightly different version from HR Bill 1480 and states: The Secretary is directed to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island, Corpus Christi Bay, Texas, at a total estimated cost of \$30,000,000, with an estimated Federal cost of \$19,500,000 an

estimated non-Federal cost of \$10,500,000, if the Secretary determines that the work was technically sound and environmentally acceptable. The Secretary shall make such a determination not later than 270 days after the date of enactment of this Act.

In 1999, the COE conducted a Project Study Plan (PSP). The study included three alternative locations and three different channel widths, under three salinity regimes, to determine the environmental benefits of an opening between the Laguna Madre and the Gulf of Mexico. The analysis showed that the new water-exchange pass would significantly ameliorate high salinity episodes in the Upper Laguna Madre. However, since these episodes were rare and expected to occur on an average of about 1 year in 5; the potential environmental benefits to marine resources and area wildlife to be achieved by the project would be negligible (DEIS, 2002). The project will improve water related opportunities and provide boat access from the Gulf to the GIWW.

Project Location

Packery Channel is a natural pass between the Gulf and Corpus Christi Bay which remained open naturally prior to 1920. Once the Corpus Christi Ship Channel was dredged in the mid 1920's, Packery Channel silted in and since then has only been periodically reopened by storm events. The channel is located (Figure 1) east-southeast of the John F. Kennedy (JFK) Causeway, which crosses the Laguna Madre between the City of Corpus Christi and Padre Island in Nueces County, Texas. To the south and west of the currently proposed project is land that has been modified for recreational, commercial, and residential development as well as undeveloped land. North and west of the proposed channel, the land is relatively undeveloped and includes the MBCHC, a State-Federal cooperative habitat and wildlife preserve on State-owned land. The project area is easily accessible by vehicle or boat from Corpus Christi and is extensively used for recreation. The area of project construction east of SH 361 will occupy part of J.P. Luby Park, a public recreational facility.

Action Area

For the purpose of this biological opinion the Service has defined the action area from the northern boundary of the Padre Island at the Kleberg-Nueces County Line to Corpus Christi Pass (Figure 2). This area includes Padre Island, Upper Laguna Madre, the Gulf, Newport Pass, Dead Man's Hole, the MBCHC, Packery Channel, the JFK Causeway, and several commercial and residential developments. Undeveloped areas consist of open water, sand flats, mudflats, beaches, wetlands and uplands. Shamrock Island was identified by resource agencies for possible project mitigation and is denoted as a separate part of the action area because the COE and the local sponsor are considering it as a possible mitigation site for impacts to seagrasses. However, mitigation efforts will not impact piping plover habitat and no nesting sea turtles have been documented to occur there.

The action area also includes two critical habitat units, TX-6 and TX-7 (Figure 3). TX-6 is the 1,100 acre, state-owned MBCHC. Although MBCHC, located in Nueces County, consists of 1,100 acres, the unit totals only 596 ac of critical habitat. The unit is described as two subunits. The first subunit is bounded on the north by Beach Access Road 3, on the east by the inland

boundary of critical habitat unit TX-7, on the south by Zahn Road and on the west by Zahn Road. The second subunit is bounded on the north by Corpus Christi Pass, on the east by US 361, on the south by the north side of Packery Channel and on west by the GIWW. Some of the uplands are privately owned and the remaining are owned and managed by the Texas General Land Office (TGLO). This unit includes two hurricane washover passes known as Newport and Corpus Christi Passes, and wind tidal flats that are infrequently inundated due to seasonal winds. The upland areas extend to where densely vegetated habitat, not used by the piping plover, begins and where the constituent elements no longer occur and include upland areas used for roosting by the piping plover (USFWS, 2001).

Unit TX-7 is the Newport Pass/Corpus Christ Pass Beach. It is 42 ha (104 ac) and located in Nueces County. The unit is along a stretch of Gulf beach 8.5 km (5.3 mi) long. It is bounded on the north by Fish Pass, on the east by mean lower low water level (MLLW), on the south by St. Bartholomew Avenue, and on the west by a line marking the beginning of dense vegetation. Portions of the unit are managed by TPWD as part of Mustang Island State Park. The unit includes lands known as wind tidal flats that are infrequently inundated due to seasonal winds.

B. Project Design

The proposed project (Figure 4) consists of opening Packery Channel by dredging a new channel from the Gulf into the existing basin area (the Inner Basin) located southeast of the SH 361 bridge (Reach 1). Two rock jetties will extend from the shoreline approximately 1,400 feet into the Gulf paralleling the channel. The Inner Basin will be widened and deepened. The existing Packery Channel west of SH 361 (Reach 2) that extends to the GIWW will also be widened and deepened.

The length of the proposed channel from the Gulf end of the jetties to the GIWW, is approximately 18,500 feet (3.5) miles. The Packery Channel alignment follows an existing channel southeast of the GIWW for approximately 2.6 miles to a basin southeast of SH 361. From this basin the proposed NE channel will extend approximately 0.9 mile toward the Gulf following a historic washover channel. Packery Channel traffic will allow recreational and small commercial boats access between the GIWW and the Gulf and will not include large commercial ships, tows, deepwater draft barges or any floating vessel with a draft greater than 4 feet.

Channel Design

Southeast of the SH 361 bridge in Reach 1, the channel width varies at the Inner Basin from 80 feet expanding to 745 feet at the channel bottom. From crest to crest of the shoreline armoring the maximum width is 800 feet. The proposed new channel extending from the basin toward the Gulf will narrow to a channel bottom width of approximately 122 feet with an approximately 280-foot span (crest to crest of the shoreline armoring). The channel depth proposed is -12 feet MLLW plus 2 feet advanced maintenance and 2 feet of allowable overdepth.

Within Reach 2, the depth of the channel is proposed at a required depth of -7 feet MLLW with 1 foot of allowable overdepth. The channel bottom width is designed for 80 feet along Reach 2, and the side slopes may extend the width of approximately 110 feet in certain areas.

The design of the channel width and depth was based on previous study results and boat statistics for the area. The study was performed by Shiner, Moseley and Associates in 1987, determined that a 40-foot Bertram yacht encompassed the majority of the registered boats in the area. Therefore, a Bertram 390 Yacht was used as the maximum size vessel for the Packery Channel design. This vessel has a hull length of 39 feet, a maximum draft of 4 feet, and a beam width of 13.25 feet. The existing SH 361 bridge over Packery Channel has a vertical clearance of 20 feet mean seal level (MSL) and a 45-foot span between bridge pilings, thus excluding all sailboats and accommodating most powerboats.

Placement Areas (PAs)

Six placement areas are proposed for placement of construction and maintenance material from the project, PAs 1, 2, 3, 4S and 4N, and MMPA. Approximately 967,500 cubic yards (cy) of new work material will be dredged or excavated and placed in PAs 1 (131,900 cy), 2 (59,300 cy), 3 (26,200 cy), 4S and 4N (744,430 cy) and as Dune Fill (5,670 cy). This number includes approximately 50,800 cy of sand excavated from PA 1 to create the capacity for new work material for this PA. The estimated maintenance dredging volume for the 50-year life of the Project is 11,057,500 cy. Maintenance material will be placed in PA 4S and 4N (estimated at 200,000 cy/year) and the MMPA (15,000 cy every 5 years). The majority of the maintenance material will be transported by currents and deposited toward the end of the jetties in Reach 1. Windblown sand deposition is also included in the annual dredging estimate. URS (2002) estimates that 70 percent of the accumulation will be between Stations 168+00 and 198+00, with the remaining 30 percent of accumulation spread evenly throughout the remainder of Reach 1 and the Inner Basin. The average accumulation in the channel in Reach 2 is much less than in Reach 1, as windblown sand is not expected to be significant course of accumulated sediment since adjacent areas are predominantly vegetated.

The beach nourishment areas (PAs 4S and 4N), located on the Gulf beach 500 feet south and north of the jetties, respectively, will be used for both new construction and maintenance material of high sand content. A total of 12,025,000 cy of placement area capacity has been identified for the life of the Project including both new work and maintenance material. The proposed MMPA is on property north of the channel near Station 50+00. This PA encompasses approximately 10.5 acres of undeveloped property and is under lease from the Port of Harlingen Authority and the State of Texas. A sand bypass system will be utilized to move sand from the areas north and south of the jetties to designated beach areas. Placement areas were established both north and south of the jetties so that either beach could be nourished depending on current erosion conditions. The decision will be made with each dredging cycle concerning which PA will be utilized.

Channel shoreline protection consisting of 3H:1V slopes armored with cellular concrete mattresses (CCM) are proposed on the north and south sides of the channel from the western end of the jetty to the SH 361 bridge (Reach 1). The CMC extends to the edge of the channel to elevation -2 MLLW. Behind the armored slopes new work fill material is required in PA 1, PA 2 and PA 3 to bring the ground elevation to grade with the top of the armoring. No shoreline armoring is proposed for the channel west of the SH 361 bridge. PA 1 and PA 3 will be constructed on the south side of the channel. These two PAs are separated by the floodgate and channel access to Lake Padre. The existing floodwall on the south side will serve as the southern retaining structure for PA 1 and PA 3. PA 2 will be located on the north side of the channel across from PA 1 and PA 3. PAs , 2, and 3 will be used for new work dredged material only. The beach nourishment areas (PAs 4S and 4N) are located on the Gulf beach north and south of the jetties and will be used for both new construction and maintenance material of high sand content. Suitability for beach placement is determined by fines content (sediment passing through # 200 sieve). Beach placement material with a fines content of 5 percent or less is preferred, but up to 30 percent is acceptable if the fines fraction does not contain a significant amount of cohesive clay (Brown, 2001). The MMPA, which will be used for maintenance material only, is located northwest of SO 361 near Packery Channel County Park. Each placement is described in detail Table 1.

Dune Fill

As part of the mitigation for impacting a dune within the 1,000-foot dune protection limit, 5,670 cy of sand will be excavated from the project site during initial construction by the COE and sand placed within the existing dune system located north of the channel.

Jetties

Two rock jetties with structural concrete caps at the crest of each jetty are proposed. The proposed jetties will parallel the channel onshore and offshore, starting approximately at station 174+00. For both jetties, construction on shore extends approximately 800 feet. The north jetty extends from the shoreline outward approximately 1,432 feet, and the south jetty extends approximately 1,482 feet. The jetties will be oriented at 12 degrees north of shore-normal to provide shelter from southeasterly summer waves. Jetty elevation is proposed at 7.25 feet MLLW with a jetty crest width of 10.5 feet. The footprint at the base of each jetty is approximately 88 feet wide. The approximate distance between the two jetty crests is 280 feet with a channel width of approximately 122 feet at -14.0 MLLW.

Sand Bypassing System

A sand bypassing system is proposed to move the sand that accumulates in the area updrift of the jetty. A sand bypassing pipe case will be constructed at approximately Station 179+00 to allow for transfer of sand from the updrift side of the jetty using fixed or mobile bypassing plants (dredging systems). The average mechanical bypassing volume of sand to maintain current

shoreline positions is 160,000 cy/year. Sand bypassing may be conducted on a yearly or biennial schedule. Regular monitoring of the beach profile in the vicinity of the jetty should be scheduled to determine where accretion and erosion are occurring on the beach. Using this information it will be determined whether bypassing is needed, as well as the required direction and volume of the bypassing. This material will be placed in PA 4S or 4N as appropriate.

Scour Protection at SH 361 Bridge

To protect the exposure and integrity of the SH 361 bridge and piers, rip-rap will be placed around the piers and abutment transition areas around the bridge. In addition, scour protection on the channel bottom will be provided west and east of the bridge. Scour protection under the bridge will extend approximately 230 feet southeast of the bridge center and approximately 140 feet northwest of the bridge center.

Recreational Development

The City has proposed recreational development and/or improvements in association with the construction of the channel (Figure 5). The majority of the development proposed by the City, occurs almost entirely within the Packery Channel project footprint. This development will provide facilities for the existing J.P. Luby Surf Park, through which Packery Channel will be constructed.

These improvements are considered secondary development impacts and are not part of the Federally cost shared project. The City has provided the location and description of the proposed development which will be constructed in two phases. The initial phase of the recreational development will occur in Reach 1 and includes parking lots and access roads, a pavilion, walkways along the channel and on the jetties with access ramps and stairs, vendor kiosks, a bath house/restroom facility, and a boat ramp. A large portion of the parking areas will be located in PA 2. Additional parking is proposed on the beach north and south of the jetties. The City is proposing to construct an underground utility crossing incorporating multiple casings for future use in conjunction with this phase of development.

In a proposed second phase, the City plans to provide additional recreational development at two locations on the south side of the channel along Reach 2 identified as Causeway Area Access Point and Packery Point Park. Specific design information about these areas has not been provided, but these areas will likely include the construction or improvement to public boat ramps, parking facilities, and restrooms.

Table 2 represents the anticipated maximum plan for park related facilities that would be built adjacent to Packery Channel over time, including infrastructure and utilities to support the various projects.

The City acknowledged these improvements are considered secondary development impacts and

are not now part of the Federally cost shared project. The City has indicated these improvements will not occur for several years and were not analyzed under this opinion. The City has agreed to consult with the Service during the planning phase and prior to construction. If it is determined these improvements may affect listed species the City has verbally stated that they will apply for a section 7 clearance if a Federal permit and/or money is involved or apply for a section 10 (a)(1)(b) permit and submit a Habitat Conservation Plan if appropriate.

Aids to Navigation

The channel design will include aids to navigation to assist boaters in maintaining course and speed through the channel. The U.S. Coast Guard (USCG) will install and maintain the aids to navigation. The development of the plan for aids to navigation will involve coordination among the local USCG Aids to Navigation Team, the COE, the City, and URS. The plan's objective will define the purpose of each navigational aid and designate the design, shape, color, numbering, light characteristics, and location.

C. Project Timing and Duration

The proposed work contracts are anticipated to be let in mid-July 2003. Mobilization of land-based equipment, dredge, and personnel to the project site will begin September 1, 2003. Mechanical excavation and construction of sand levees for PA 1, 2, 3, placement of material in PA 1 and 3; and construction of the jetties will begin January, 2004 and expected to be completed by April, 2004. Channel dredging of Reach 1 will begin after completion of the jetties in April and channel dredging in Reach 2 will begin in September 2004. The total duration of the construction project is estimated to be 30 months (2.5 years). Maintenance dredging is scheduled to occur approximately every 2 years and will be coordinated with the Service. The life of the project is 50 years.

D. Conservation Measures

The COE concluded that based on modeling, a slight decrease in tidal range of approximately 0.04 to 0.09 feet could occur in Critical Habitat Unit TX-6, MBCHC, as a result of opening Packery Channel. This could result in slightly more tidal flat exposure, thereby increasing bird available foraging habitat to a minor degree. The effect is not certain due to normal daily and seasonal variations, and could result in possible impacts to the prey base of shorebirds and changes in habitat. The COE also anticipates the permanent loss of 1.5 acres of critical habitat and the periodic disturbance of 24.6 acres and of piping plover critical habitat and nesting sea turtle habitat by channel dredging and periodic nourishment of PAs 4S and 4N with sand from initial and maintenance dredging and from the sand bypass system. The total 26.1 acres are located within Critical Habitat Unit TX-7.

To reduce the potential impacts of the proposed project on the piping plover, nesting sea turtles, and other resources, the COE and local sponsor have offered the following conservation

measures for:

Sea Turtles

- 1) No hopper dredging will occur during either project construction or maintenance to preclude impacts to swimming turtles from dredging.
- 2) All effluent from confined upland PAs will meet state water quality criteria.
- 3) Submerged aquatic vegetation that will be directly impacted by project construction will be mitigated and replaced at a ratio of 3:1.
- 4) Potential secondary project impacts to MBCHC will be monitored (MOU attached).
- 5) During construction the beach will be monitored daily prior to initiation of any construction activity.
- 6) A Service-approved monitor will be hired by the construction contractor and immediately report any sea turtles or nests to the Service and COE inspector.
- 7) Construction personnel, COE construction inspectors, City representatives will receive training to recognize and avoid impacts to sea turtles and understand the reporting and monitoring requirements.
- 8) Any turtles, nests, or eggs found by monitors or reported by construction personnel will be safeguarded until they can be relocated by appropriate authorities.
- 9) Ruts in the beach will be smoothed out at the end of construction each day so that turtle tracks can be found and small turtle hatchlings will not become entrapped in deep ruts.
- 10) If necessary, night lights will be directed and shielded.
- 11) After construction, public education signs will be posted along the jetties describing sea turtles and provide information on what to do and whom to call in the event turtles are found on the beach.

Piping Plover

- 1) Each maintenance project resulting in beach placement will be coordinated with the Service.
- 2) The location and timing of placement will be coordinated with the Service prior to placement.

MBCHC - Critical Habitat Unit TX-6

The City and TGLO entered into an MOU (Attachment A) to provide a mechanism to monitor any adverse effects that the project might have on the MBCHC, determine any mitigation measures that may be needed, and to establish procedures for undertaking the mitigation measures. The TGLO and City agreed to establish a task force, to be known as the Packery Channel Task Force. The Task Force will consist of representatives from the TGLO, City, COE, the Service plus any members of the MBCHC Management Team that the TGLO designates. The City with the advice of the COE, agreed to undertake the monitoring program described in Attachment B, and the Task Force will review the results of the monitoring activities as the results become available.

The City has agreed, to the extent permissible under State Law, to undertake actions necessary to counter, mitigate, and resolve any significant negative effects that are caused by the project, including, but not limited to, increased vessel traffic. The actions taken are in addition to and not in lieu of any additional mitigation responsibilities outlined in this opinion or EIS.

The City also committed to establish and maintain a no wake zone in those portions of the Packery Channel that traverse the MBCHC, establish and maintain a marina/parks office adjacent to the project which will staff Marina marshals or other appropriate City staff to enforce the no wake zone.

A quality assurance/quality (QA/QC) control plan for both baseline and post-construction monitoring efforts will be developed. The monitoring plan will include pre-construction baseline that will be used to establish baseline conditions at both the MBCHC and the reference/control site. Baseline to be conducted during the first year, prior to commencement of channel dredging. Ground truthing will take place immediately after the aerial photographs are developed and reviewed. Post construction monitoring will commence upon the completion of channel dredging. A monitoring survey year will be from September to August. During years 2 through 5 intensive monitoring will include avian surveys, benthic analyses, seagrass presence/absence surveys, field inspections, aerial photographs, and tidal elevation analyses at the MBCHC site. Year 2 is considered to be first year after channel dredging is complete. Reference/Control site will consist of aerial photographs and tide gauge analyses, unless significant changes are observed to warrant additional monitoring measures.

Draft copies will be provided to the MBCHC Management Team to review and comment. Annual summary reports will be submitted to the City and the City will in turn provide copies of the documents to the MBCHC Management Team.

Shamrock Island

To mitigate for impacts to seagrasses the City has agreed to construct or cause to be constructed breakwater(s) that will assist in protecting Shamrock Island and will create or cause to be created

approximately 15.6 acres of submerged aquatic vegetation (SAV). Construction of the breakwater(s) will be concurrent with the construction of Packery Channel. The City will be responsible to the TGLO and the School Land Board for successful completion of all requirements of the Mitigation Plan (Attachment C).

The City will partner with and work through the Coastal Bend Bays and Estuaries Program (CBBEP) to perform the required mitigation. The City will deposit \$1,250,000 with the CBBEP to fund the required mitigation. A team consisting of the Nature Conservancy, CBBEP, TGLO and applicable state and federal resource agencies will provide input into the project. All recommendations will be a consensus of the team and must be approved by the TGLO and Nature Conservancy as landowners. The CBBEP will undertake appropriate studies to determine the correct pattern of work to be undertaken. Areas of work to be considered will include, but not be limited to, protection of the North end of the Island, protection of the South end of the Island, re-nourishment of the feeder beach, and possible repair and/or upgrade of the existing geotube.

The CBBEP with the consensus of the team and with approval of the TGLO and the Nature Conservancy will determine specific locations of the breakwater(s), type of breakwater(s) and habitat creation. The created SAV habitat will be allowed to naturally vegetate for 2 full grown seasons after the breakwater is constructed. If after three years, 50% of the required SAV mitigation has naturally vegetated the CBBEP will consult with the team on whether to plant seagrass in areas that have not reached 50% coverage. If after 5 years, 70% coverage of the required SAV mitigation has not been achieved, the CBBEP will again consult with the team for recommendations. The plantings, if necessary will be funded from the \$1,250,000. The CBBEP, on behalf of the City, will submit annual reports beginning in year 3 to the TGLO. The project will be determined to be a success when the breakwater(s) has/have been installed, approximately 15.6 acres of SAV have been created and no significant amount of habitat (excluding open water fish habitat) has been lost on Shamrock Island.

As previously stated, there are no anticipated impacts to listed species under the jurisdiction of the Service at Shamrock Island, therefore, no effects analysis will be conducted on the portion of the total action area beginning at the southern boundary of Mustang Island State Park, near Corpus Christi Pass, to the northern tip of Shamrock Island.

II. Status of the Species/Critical Habitat

a. Species/critical habitat description

Sea Turtles

The Service has jurisdiction for regulating sea turtles when they come ashore to nest. The National Marine Fisheries Service has jurisdiction over sea turtles in the marine environment. Five species of sea turtles are found in U.S. waters or that nest on U.S. beaches. They are the

leatherback, hawksbill, loggerhead, green and Kemp's ridley. Although, all five have been known to nest in Texas, the leatherbacks and hawksbills are rare nesters in the southeastern US but offshore waters are important for feeding, resting and as migratory corridors. Leatherback nesting has not been confirmed since 1930 and only one hawksbill nest has been recorded on the Texas coast in June 1998 (D. Shaver, person. comm.). The remaining three, the Kemp's ridley, loggerhead and green turtles have documented nesting on Texas beaches in the vicinity of the proposed action, therefore, will be the only species of sea turtles addressed in this opinion. The status of each sea turtle species which may be affected by the proposed project is given below.

Loggerhead sea turtle

Species/critical habitat description

The loggerhead sea turtle was listed as a threatened species throughout its entire range on July 28, 1978 (43 FR 32800). Within the area covered by the listing, this species is known to occur in: Alabama, American Samoa, California, Connecticut, Delaware, Florida, Georgia, Guam, Hawaii, Louisiana, Massachusetts, Maryland, Northern Mariana Islands, Mississippi, North Carolina, New Jersey, New York, Oregon, Puerto Rico, Rhode Island, South Carolina, Texas, Virginia, Virgin Islands: Palau, tropical and temperate seas. Currently, no critical habitat is designated for this species.

This species inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. The loggerhead sea turtle is characterized by a large head with blunt powerful jaws. The carapace and flippers are a reddish-brown color with a yellow plastron. The carapace has five pairs of costal scutes with the first touching the nuchal scute. There are three large inframarginal scutes on each of the bridges between the plastron and carapace. Adults grow to an average weight of about 200 pounds. Hatchlings lack the reddish tinge and vary from light to dark brown dorsally. Both pairs of appendages are dark brown above and have distinct white margins. The plastron and other ventral surfaces may be described as dull yellowish tan and there is usually some brown pigmentation in the phalangeal portion of the web ventrally.

This species is widely distributed within its range and it can be found hundreds of miles offshore. It also inhabits inshore areas such as bays, lagoons, salt marshes, ship channels and mouths of large rivers.

Life history

Loggerheads are nocturnal nesters, although some daytime nesting occurs. The United States nesting season extends from about May through August. Preferred nest sites are sloping beaches 1.5 to 2.5 feet above waterline. They are known to nest from one to seven times within a nesting season (mean is about 4.1 nests per season) at intervals of approximately 14 days. Mean clutch size varies from about 100 to 126 eggs. Incubation ranges from about 45 to 95 days, depending

on incubation temperatures, but averages 55 to 60 days for most clutches in Florida; hatchlings generally emerge at night. Remigration intervals can vary from 1 to 7 years for nesting loggerheads, but 2 to 3 years is the most common. Age at sexual maturity is believed to be between 20 to 30 years.

Most loggerhead hatchlings originating from United States beaches are believed to lead a pelagic existence in the North Atlantic Gyre, perhaps as long as 10 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating at sea in association with sargassum rafts. Once they reach a certain size, those juvenile loggerheads begin recruiting to coastal areas in the western Atlantic where they become benthic feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. Such juveniles occupy coastal feeding grounds for a decade or more before maturing and making their first reproductive migration with females returning to their natal beach to nest.

Predation of hatchlings and very young turtles is assumed to be significant, and predation of subadult through adult stage turtles is assumed to be less common (USFWS, 1991). Stancyk (1982) reported predators of juvenile and adult turtles to include at least six species of sharks, killer whales, seabass and grouper. Tiger sharks appear to be the principal predator of subadult and adult turtles.

The species feeds on a variety of marine invertebrates and plants, primarily feed on mollusks, crustaceans, and sargassum plants. Loggerheads may scavenge fish or fish parts or ingest fish incidentally in some circumstances but the species is not a fish eater in any primary sense (NMFS and USFWS, 1991).

Population dynamics

Recent genetic analyses using restriction fragment analysis and direct sequencing of mitochondrial DNA (mtDNA) have been employed to resolve management units among loggerhead nesting cohorts of the southeastern U.S. (Bowen *et al.* 1993, and B.W. Bowen, University of Florida, Gainesville, in litt., November 17, 1994, and October 26, 1995). This type of genetic research has identified the following four loggerhead nesting subpopulations in the western North Atlantic: (1) the Northern subpopulation occurring from North Carolina through northeast Florida; (2) South Florida subpopulation occurring from just north of Cape Canaveral around the Florida Keys to Sarasota; (3) Northwest Florida subpopulation occurring on Florida's Panhandle beaches; and (4) Yucatan subpopulation occurring on the eastern Yucatan Peninsula, Mexico. These data indicate that gene flow between these four regions is very low. If nesting females are extirpated from one of these regions, regional dispersal will not be sufficient to replenish the depleted nesting population (Bowen *et al.* 1993, and B.W. Bowen, University of Florida, Gainesville, in litt., October 26, 1995).

The Northern subpopulation has declined substantially since the mid-1970s but may have stabilized in recent years. The South Florida subpopulation has shown significant increases over

the last 25 years, indicating the population is recovering; however, a trend could not be detected during the first 7 years (1989 to 1995) of the State of Florida's Index Nesting Beach Survey program. Nesting surveys in the Northwest Florida and Yucatan subpopulations have been too irregular to allow for a meaningful trend analysis. It is unknown whether the nesting sea turtles along beaches in Alabama, Mississippi, and Louisiana are genetically distinct subpopulations or are genetically similar to the Northwest Florida subpopulation.

Loggerheads nest within the U.S. from Texas to Virginia, although the major nesting concentrations are found in Florida, Georgia, South and North Carolina. About 80 percent of loggerhead nesting in the southeastern United States occurs in six Florida counties (Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties). Loggerhead sea turtles nest within the continental United States from Louisiana to Virginia. Major nesting concentrations in the U.S. are found on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (Hopkins and Richardson, 1984).

Status and Distribution

Reason for Listing:

Threats to loggerhead populations include loss or degradation of nesting habitat from coastal development and beach armoring; beach nourishment; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; disease; and incidental take from channel dredging and commercial trawling, longline, and gill net fisheries. There is particular concern about the extensive incidental take of juvenile loggerheads in the eastern Atlantic by longline fishing vessels from several countries.

Range-wide Trend:

Total estimated loggerhead nesting in the southeastern United States is approximately 50,000 to 70,000 nests per year (NMFS and USFWS, 1991). From a global perspective, the southeastern United States nesting aggregation of loggerhead sea turtles is important to the survival of the species and is second in size only to that which nests on islands in the Arabian Sea off Oman (Ehrhart, 1989; NMFS and USFWS, 1991b; Ross, 1995). The status of the Oman colony has not been evaluated recently, but its location in a part of the world that is vulnerable to disruptive events (e.g., political upheavals, wars, catastrophic oil spills) is cause for considerable concern (Meylan et al., 1995). The loggerhead nesting aggregations in Oman, the southeastern United States, and Australia account for about 88 percent of nesting worldwide (NMFS and USFWS, 1991b).

In the United States, the population of loggerheads has declined since the early 1970s, but most of that decline occurred prior to 1979. There has been no significant trend in recent years (Turtle Expert Working Group, 1998; 2000), and nesting in Texas between 1979 -2002 has included

only 20 nests, 1 of which was documented in 2002 at Padre Island. Nesting surveys along the south Texas beaches occur annually from mid-July through August. Loggerheads take approximately 20 to 30 years to mature; however, so the effects of decline in immature loggerheads might not be apparent on nesting beaches for decades.

Loggerhead populations in Honduras, Mexico, Colombia, Israel, Turkey, Bahamas, Cuba, Greece, Japan, and Panama have also been declining. This decline continues and is primarily attributed to shrimp trawling, coastal development, increased human use of nesting beaches, and pollution.

Kemp's ridley sea turtle

Species/critical habitat description

Kemp's ridley sea turtle was listed as an endangered species throughout its entire range on July 28, 1978 (43 FR 32800). Within the area covered by the listing, the species is known to occur in Alabama, Connecticut, Delaware, Florida, Georgia, Louisiana, Massachusetts, Maryland, Mississippi, North Carolina, New Jersey, New York, Rhode Island, South Carolina, Texas, Virginia; Mexico-Atlantic Coast, tropical and temperate waters in Atlantic Basin. Currently, there is no critical habitat designated for this species. The range of the Kemp's ridley includes the Gulf coasts of Mexico and the United States, and the Atlantic Coast of North America as far north as Nova Scotia and Newfoundland. Most Kemp's ridleys nest on the coastal beaches of the Mexican states of Tamaulipas and Veracruz, although a very small number nest consistently at Padre Island National Seashore in Texas.

It is the smallest and most endangered of the sea turtles and can be found in the waters within the project action area and along beaches in south Texas and Alabama. Kemp's ridley adults reach about 2 feet in length and weigh up to 75-100 pounds. The adult Kemp's ridley has an unusually broad, heart-shaped, keeled carapace that is serrated behind the bridge, almost as wide as it is long and is usually olive-gray. The carapace has five pairs of costal scutes. In each bridge adjoining the plastron to the carapace, there are four infra-marginal scutes, each of which is perforated by a pore. The head has two pairs of prefrontal scales. The Kemp's ridley has a triangular-shaped head with a somewhat hooked beak with large crushing surfaces. Juveniles have a dark-charcoal colored carapace, but as they age this changes to olive-green or grey. The lower shell is a light yellowish color. Preferred habitat is shallow coastal and estuarine water, primarily where crabs are found.

Life history

Nesting occurs primarily in the vicinity of Rancho Nuevo, Tamaulipas, Mexico from April to June, during which time these turtles appear off the Tamaulipas and Veracruz coasts of Mexico. Precipitated by strong winds, the females aggregate to nest en masse during daylight hours. These nesting aggregations are known as *arribadas* or *arribazones*. Nests are selected on well-

developed, elevated dunes in remote areas adjacent to large marsh complexes or shallow embankments. Some females breed annually and nest an average of one to four times in a season with an average of 2.5 clutches per season at intervals of 10 to 28 days. Clutch size averages 110 eggs. Hatchlings emerge after about 50 days of incubation and hatchling emergency occurs during the night and day. Sexual maturity is believed to be between 7 to 15 years of age.

Each year some nests are also found at scattered locations between the Texas coast and Veracruz, Mexico. Very rarely, Kemp's ridleys nest at other locations in the U.S. outside of Texas and more Kemp's ridley nests are consistently found in south Texas, including PINS than any other location in the U.S.

Since 1978, the Service has been involved in an international cooperative project designed to establish nesting sites for Kemp's ridley in the United States. Eggs were collected in Mexico from 1978 to 1988 and transported to Padre Island National Seashore for imprinting purposes. Hatchlings were released into the water and then immediately recaptured and raised in "head start" facilities at Galveston, Texas, until they were mature enough to be released into the Gulf of Mexico. Currently, a similar program is coordinated by USGS at PINS. Turtles imprinted for Padre Island nesting sites have begun to return after 10 years, changing the belief that sexual maturity took 15 years to develop. In 2001, three nests were reported from Padre Island National Seashore. In 2002, 38 Kemp's ridley nests were documented in south Texas at North Padre Island, Matagorda Peninsula, Quintana Beach and Galveston Island. Fourteen other nests were located in other parts of the U.S.

This turtle is a shallow water benthic feeder with a diet consisting primarily of crabs, shrimp, snails, sea urchins, sea stars, fish, and occasionally marine plants may be eaten.

Population dynamics

The Kemp's ridley sea turtle is the most seriously endangered of the sea turtles. Its numbers have precipitously declined since 1947, when more than 40,000 nesting females were estimated in a single *arribada*. The nesting population produced a low of 702 nests in 1985. Since the mid-1980s, the number of eggs laid in a season has been increasing primarily due to nest protection efforts and implementation of regulations requiring the use of turtle excluder devices in commercial fishing trawls. During the 1999 and 2000 nesting seasons, more than 3,600 nests and 6,000 nests, respectively, were present on the Mexico nesting beaches.

Status and distribution

Reason for Listing:

For at least two decades, several factors have contributed to the decline of sea turtle populations along the Atlantic and Gulf coasts. Turtles have been victims of commercial over-utilization of eggs and turtle parts, incidental catches during commercial fishing operations, disturbance of

nesting beaches by coastal housing, and marine pollution and debris. The reproductive strategy of sea turtles involves producing large numbers of offspring to compensate for high natural mortality through the first several years of life; however, excessive exploitation of turtles has increased mortality beyond that which can be compensated for by high natality. Therefore, activities that continue to affect the survivability of turtles on their remaining nesting beaches, particularly the high-density nesting beaches, will seriously reduce the Service's ability to conserve sea turtles. Today, under strict protection, the population appears to be in the very early stages of recovery.

Range-wide trend

Kemp's Ridley sea turtles nest annually along south Texas beaches. Between 1979 and 2002, approximately 138 nests have been documented. Kemp's Ridley sea turtles are native nesters at the PAIS and since 1978 an international project has been on-going to establish a secondary nesting colony at PAIS. The date of the nesting season varies slightly each year. In Mexico, Kemp's Ridley nests have been recorded as early as March and as late as August. A complete distribution of Kemp's Ridley sea turtles along the Texas coast was published by NOAA (Manzella and Williams, 1992).

Green Sea Turtle

Species/critical habitat description

The green sea turtle (*Chelonia mydas*) was listed as endangered in the breeding colony populations in Florida and on Pacific coast of Mexico under the ESA on July 28, 1978 (43 FR 32800). All other populations are listed as threatened. The green turtle has a worldwide distribution in tropical and subtropical waters. Major green turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. NMFS designated critical habitat for the green sea turtle on October 2, 1998. Critical habitat only included waters extending seaward (5.6 km) from the mean high water line of Isla de Culebra (Culebra Island, Puerto Rico).

Adult green sea turtles can grow to a carapace length of four feet and range from 250 to 450 pounds. The adult's carapace is smooth, lacks a keel and is light to dark brown with dark mottling.

Green turtles are long-distance migrants and are occasionally seen in open sea in route from feeding grounds to nesting beaches or vice versa. They occupy three habitat types: high-energy oceanic beaches, convergence zones in the pelagic habitat, and benthic feeding grounds in relatively shallow, protected waters. They are generally found in shallow waters (except when migrating) inside reefs, bays, estuaries, and inlets, especially sea grass beds. Favored habitat appears to be lagoons and shoals with an abundance of marine grass and algae.

Life History

Open beaches with sloping platform and minimal disturbance are required for nesting. A variety of sands can be used for nesting, but must be friable and well drained. Females deposit egg clutches on high energy beaches, usually on islands, where a deep nest cavity can be dug above the high water line. Clutch size ranges from 75 to 250 eggs with incubation lasting from 48 to 70 days. Nocturnal nesting occurs in 2, 3, or 4 year intervals and as many as seven clutches are laid in one season. Re-nesting is usually within 1.5 km from a previous nesting site. Based on growth rate studies on wild green turtles, estimates of age at sexual maturity range from 20-50 years.

Hatchlings leave the beach and apparently move into convergency zones in the open ocean where they spend an undetermined length of time. When turtles reach a carapace length of approximately 20-25 cm, they leave the pelagic habitat and enter benthic feeding grounds. Most commonly these foraging habitats are pasture of sea grasses and/or algae but small green turtle can also be found over coral reefs, worm reefs and rocky bottoms. Some feeding grounds only support certain size classes of green turtles; the turtles apparently move among these foraging areas called developmental feeding grounds as they grow. Coral reefs or rocky outcrops near feeding pastures are often used as resting areas, both at night and during the day.

Population Dynamics

Within the U.S., green turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (NMFS and USFWS, 1991a). Nesting also has been documented along the Gulf coast of Florida on Santa Rosa Island (Okaloosa and Escambia Counties) and from Pinellas County through Collier County (USFWS, 2003). Green sea turtles have been known to nest in Georgia, but only on rare occasions (USFWS, 2003). The first documentation of green sea turtle nests in South Carolina were reported in 1996 (USFWS, 2003). Unconfirmed nesting of green turtles in Alabama has also been reported (USFWS, 2003).

Status and Distribution

Reason for Listing:

Green sea turtles have been adversely affected by both direct harvest and degradation of nesting habitat. The eggs and succulent meat of this species have provided a dietary staple in many regions, and fancily prepared green sea turtle soups and steaks have been relished by epicures for ages (Palmer and Braswell, 1995), incidental take from channel dredging and commercial trawling, longline, and gill net fisheries; the loss and degradation of nesting habitat from continued and future coastal development and beach stabilization; sediment disposal on beaches and beach grooming; disorientation of hatchlings by beachfront lighting; increased recreational activities on the beach (e.g., off-road vehicles); excessive nest predation by native and non-native

predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; and disease. Recent coastal development in many areas has destroyed or seriously damaged nesting beaches of this species, whose numbers have decreased almost everywhere. Another major factor contributing to the green sea turtle's decline worldwide is commercial harvest for eggs and food. Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor and has seriously impacted green sea turtle populations in Florida, Hawaii, and other parts of the world. The tumors interfere with swimming, eating, breathing, vision, and reproduction, and turtles with heavy tumor burdens become severely debilitated and die.

Range-wide Trend:

The primary nesting sites in United States Atlantic waters are along the east coast of Florida, with additional sites in the United States Virgin Islands and Puerto Rico. Total population estimates for the green sea turtle are unavailable, and trends based on nesting data are particularly difficult to assess because of wide year-to-year fluctuations in numbers of nesting females, difficulties of conducting research on early life stages, and long generation time. For instance, in Florida, where the majority of green turtle nesting in the southeastern United States occurs, estimates range from 200 to 1,100 females nesting annually. Since 1979, only 7 green sea turtle nests have been documented in south Texas (Shaver, 2000). However, in the 2002 season, 3 nests were reported on Padre Island.

In the United States Pacific, over 90 percent of nesting throughout the Hawaiian archipelago occurs at the French Frigate Shoals, where about 200 to 700 females nest each year. Elsewhere in the United States Pacific, nesting takes place at scattered locations in the Commonwealth of the Northern Marianas, Guam, and American Samoa. In the western Pacific, the largest green sea turtle nesting aggregation in the world occurs on Raine Island, Australia, where thousands of females nest nightly in an average nesting season. In the Indian Ocean, major nesting beaches occur in Oman, where 6,000 to 20,000 females are reported to nest annually. Populations in Surinam, and Tortuguero, Costa Rica, may be stable, but there is insufficient data for other areas to confirm a trend.

e. Analysis of the species/critical habitat likely to be affected

All Sea Turtles

The proposed action has the potential to adversely affect nesting females, nests, and hatchling Kemp's ridley, loggerhead and green sea turtles within the proposed project area. The effects of the proposed action on sea turtles will be considered further in the remaining sections of this opinion. Potential effects include destruction of nests deposited within the boundaries of the proposed project; harassment in the form of disturbing or interfering with females attempting to nest within the construction area or on adjacent beaches as a result of construction activities; disorientation of hatchling turtles on beaches adjacent to the construction area as they emerge

from the nest and crawl to the water as a result of project lighting and/or deep ruts caused by vehicles; and, behavior modification of nesting females due to escarpment formation within the project area during a nesting season resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs. The quality of the placed sand could affect the ability of female turtles to nest, the suitability of the nest incubation environment, and the ability of hatchlings to emerge from the nest.

Piping plover (*Charadrius melodus*)

Species/critical habitat description

The piping plover was Federally listed as endangered in the Great Lakes watershed, and as threatened elsewhere in its range, on January 10, 1986. The piping plover is a small Nearctic (i.e., North American) shorebird approximately 7 inches long with a wingspread of about 15 inches (Palmer, 1967). Breeding birds have white underparts, light beige back and crown, white rump, and black upper tail with a white edge. In flight, each wing shows a single, white wing stripe with black highlights at the wrist joints and along the trailing edges. Breeding plumage characteristics are a single black breastband, which is often incomplete, and a black bar across the forehead. The black breastband and brow bar are generally more pronounced in breeding males than females (Wilcox, 1959). The legs and bill are orange in summer, with a black tip on the bill.

Areas designated as critical habitat are essential to the conservation of that species. Critical habitat for Great Lakes breeding populations was designated on May 7, 2001. Those areas designated as critical habitat for the Great Lakes populations contain the essential features for successful foraging, nesting, rearing of young, intra-specific communication, genetic exchange, roosting, dispersal, or sheltering. The primary constituent elements for Great Lakes piping plover critical habitat are found on Great Lakes islands and mainland shorelines that support open, sparsely vegetated sandy habitats, such as sand spits or sand beaches, that are associated with wide, unforested systems of dunes and inter-dune wetlands.

Critical habitat for the Northern Great Plains breeding populations was designated on September 11, 2002. Those areas designated as critical habitat for the Northern Great Plains contain essential features for courtship, nesting, sheltering, brood-rearing, foraging, roosting, intraspecific communication, migration, and the dynamic ecological processes that create and maintain piping plover habitat. The primary constituent elements for the Northern Great Plains critical habitat exist on different habitat types including: (1) mixosaline to hypersaline wetlands consisting of shallow, seasonally to permanently flooded wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats, springs or fens along the edges of alkali lakes and wetlands and adjacent uplands along the high water mark of the alkali lake or wetland; (2) rivers with sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river; (3) reservoirs with sparsely vegetated shoreline beaches, peninsulas, islands composed of sand,

gravel, or shale , and their interface with the water; and (4) inland lakes (Lake of the Woods) with sparsely vegetated and windswept sandy to gravelly islands, beaches, and peninsulas and their interface with the water body.

Critical habitat on the wintering grounds was designated July 10, 2001; that designation included 142 areas along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas, to provide sufficient wintering habitat to support the piping plover at the population level and geographic distribution necessary for recovery of that species. Those areas designated as critical habitat contain the essential physical and biological elements for the conservation of wintering piping plovers and physical features necessary for maintaining the natural processes that provide appropriate foraging, roosting and sheltering habitat components. The primary constituent elements for wintering ground critical habitat are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), associated dune systems, and flats above annual high tide. Primary constituent elements of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important for roosting plovers.

Life history

Northward migration to the breeding grounds occurs during late February, March and early April, with males establishing territories by early April (Patterson 1988, MacIvor 1990), which they defend aggressively against adjacent males. Courtship behavior includes aerial flights, digging of several nest scrapes, and ritualized stone tossing. Plovers will breed at 1 year of age (MacIvor 1990, Strauss 1990, Haig 1992) and are monogamous, but usually shift mates between years (Wilcox 1959, Haig and Oring 1988, MacIvor 1990). Piping plovers generally fledge a single brood per season, but may re-nest several times if previous nests are lost or if a brood is lost within several days of hatching (Wrenn 1991, Goldin 1994, Rimmer 1994).

Piping plover nests are situated above the high tide line on unvegetated coastal beaches, sandflats at the ends of sand spits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, washover areas cut into or between dunes, and areas where suitable dredged material has been deposited. The nest cups are about an inch deep and 2.5 inches in diameter. Clutch size is usually four eggs, one laid every other day, and are gray to pale sand-colored with a few dark spots. The eggs blend almost perfectly with the sand, making them very difficult to see. Both parents incubate the eggs with incubation averaging about 27 to 30 days and shared equally by both sexes (Wilcox 1959, Cairns 1977, MacIvor 1990). Chicks remain together with one or both parents until they fledge at 25 to 35 days of age.

Southward migration to the wintering grounds along the southern Atlantic coast and Gulf of Mexico shoreline extends from late July, August, and September. Individuals can be found on their wintering grounds throughout the year, but sightings are rare in May, June, and early July (USFWS, 2001). In general, wintering piping plovers feed extensively on intertidal beaches,

mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependant on a mosaic of sites distributed through the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change.

Piping plovers forage mostly on benthic invertebrates, insects, and crustaceans found within the inter-tidal areas of ocean beaches, washover areas, mudflats, sand flats, wrack lines and shorelines of coast ponds, lagoons or salt marshes.

Population dynamics

Coinciding with major industrial development, piping plovers were extirpated from most of the Great Lakes beaches in the late 1970s and early 1980s. In 1977 the Great Lakes population was estimated at 31 nesting pairs (Lambert and Ratcliff, 1979), but declined to 17 pairs by 1985 (USFWS, 1985). Since 1986, nests have been recorded at 30 breeding sites with populations ranging from 12 to 25 breeding pairs. Numbers have increased substantially over the last 10 years due to a combination of natural factors and intensive management (Ferland and Haig, 2002). The latest International Piping Plover survey recorded 72 adults on the breeding grounds (Ferland and Haig, 2002).

In 1986 and 1987, there were an estimated 1,258 to 1,326 breeding pairs of piping plovers within the Northern Great Plains breeding population. Estimates from the 1991 International Piping Plover Census estimated that there were 1,486 breeding pairs in the Northern Great Plains. The 1996 census indicated that the population numbered about 3,284 adults, which would be the largest of the three breeding populations (i.e., Northern Great Plains, Great Lakes, and Atlantic Coast). The Prairie Canada populations represent the greatest sub-regional extent of habitat having areas with some of the highest numbers of breeding pairs in the species range. Those numbers have declined over the past 5 years due to changes in habitat and possible dispersal (Ferland and Haig, 2002). The U.S. Northern Great Plains population has increased to 1,981 adults according to the 2001 International Census. The predominant increase event for the 2001 census was the highest numbers of plovers observed on the Missouri River since their listing (Ferland and Haig, 2002). However, in addition to declines in Prairie Canada, declines occurred in all U.S. Northern Great Plains states except South Dakota, North Dakota, Kansas, and Colorado. Overall, 2,953 adults were observed in 2001 in the U.S. Northern Great Plains and Prairie Canada populations (Ferland and Haig, 2002).

Historical trends for the Atlantic Coast piping plover population have been gathered from largely qualitative records. In the nineteenth century, piping plovers were common summer residents along the Atlantic Coast; by the 20th century, uncontrolled hunting and egg collecting greatly reduced their populations. Following the passage of the Migratory Bird Treaty Act in 1918,

piping plover numbers recovered to some extent. Raithel (1984) showed that Rhode Island piping plover numbers reached a 20th century peak following the 1938 hurricane which flattened sand dunes and shoreline developments. After World War II, populations declined due to dune stabilization efforts and construction of summer homes. The population partially recovered following another severe hurricane in 1954, but then began a decline which continued through the early 1980s. Recent population estimates indicate that, since the late 1980s, piping plover populations have increased steadily along the Atlantic Coast from 790 in 1986 to 1,349 in 1995 (USFWS, 1996), 2,581 adults in 1996 (USFWS, 1999), and 2,920 adults in 2001. While there has been a positive 5-year trend in Atlantic coast numbers, there are substantial declines in plover populations at the southern end of the range (Ferland and Haig, 2002).

Piping plovers breed only in North America within three geographic regions encompassing three distinct breeding populations: the Northern Great Plains, the Great Lakes, and the Atlantic Coast. The piping plover's primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies (USFWS 1988, 1989a, 1989b, 1996). Southward migration to wintering grounds extends from late July, August, and September (USFWS, 1996).

Loss and degradation of breeding habitat due to shoreline development and the alteration of river flows and creation of reservoirs have been major contributors to the species' decline. Recreational activity, coastal development, and dune stabilization have resulted in loss of suitable sandy beaches and other littoral habitats. Breeding success continues to be affected because of human disturbance (foot and vehicular traffic), which destroys nests and young (USFWS 1989b, 1996). Overall, winter habitat loss is difficult to document; however, a variety of human-caused disturbance factors have been noted that may affect plover survival or utilization of wintering habitat. Those factors include recreational activities, inlet and shoreline stabilization, dredging of inlets that can affect spit formation, beach maintenance and renourishment, and pollution. In some areas, natural erosion of barrier islands may also result in habitat loss. Since piping plovers spend 55 to 80 percent of their annual cycle associated with wintering areas, factors that affect their well-being on the wintering grounds can substantially affect their survival and recovery (USFWS, 1996).

Status and Distribution

Reasons for listing:

Hunting during the 19th and early 20th centuries likely led to initial declines in the species; however, shooting piping plovers has been prohibited since 1918 pursuant to the provisions of the Migratory Bird Treaty Act. Other human activities, such as habitat loss and degradation, disturbance from recreational pressure, contaminants, and predation are likely responsible for continued declines. These factors include development and shoreline stabilization.

Range-wide Trend:

Two range-wide population surveys have been conducted for the piping plover; the 1991 (Haig and Plissner, 1992) and 1996 International Piping Plover Censuses (Plissner and Haig, 1997). These surveys were completed to help determine the species distribution and to monitor progress toward recovery.

Great Lakes Population

The Great Lakes plovers once nested on Great Lakes beaches in Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and Ontario, Canada. Russell (1983) reviewed historical records to estimate the pre-settlement populations of the plover throughout this range. While estimates may be high for some Great Lakes states, no other historic estimates are available. Total population estimates ranged from 492 to 682 breeding pairs in the Great Lakes region; Michigan alone may have had the most with as many as 215 pairs.

The endangered Great Lakes population is at a perilously low level. From an all-time low of 12 nesting pairs in 1990, the population has increased to 32 nesting pairs in 1999, then declined again to 30 pairs in 2000, but has not increased significantly since listing. During this period most nesting occurred in Michigan, but in 1998, and again in 1999, one pair nested along the Lake Superior shoreline in Wisconsin.

Reproduction is adversely affected by human disturbance of nesting areas and predation by foxes, gulls, crows and other predators. Shoreline development, such as the construction of marinas and breakwaters, has adversely affected nesting and brood rearing in this population. As with other populations, unleashed dogs and feral cats may harass and kill the birds.

Atlantic Coast Population

The Atlantic Coast piping plover breeds on coastal beaches from Newfoundland and southeastern Quebec, Canada to North Carolina. Piping plovers were common along the Atlantic Coast during much of the 19th century, but nearly disappeared due to excessive hunting for the millinery trade. Following passage of the Migratory Bird Treaty Act in 1918, numbers recovered to a 20th century peak which occurred during the 1940's. The current population decline is attributed to increased development and recreational use of beaches since the end of World War II.

The Atlantic Coast piping plover population has increased from 790 pairs since listing to 1,386 pairs in 1999. However, it is important to note that the increase is very unevenly distributed, with most pairs occurring in New England, and can be partially attributed to increased survey efforts, especially in the southern half of the species' range (USFWS, 1996). From 1986 to 1994, the Southern recovery unit increased from 158 to 217 nesting pairs, then declined to 183 pairs in 2000. The recovery objective for the Atlantic Coast population and the Southern recovery unit is 2,000 and 400 breeding pairs, respectively (USFWS, 1996).

The recovery plan (USFWS, 1996) cites a population viability analysis (Melvin and Gibbs, 1994) that states:

“The modeled scenario that most closely approximates the current status of the Atlantic coast piping plover population – 1,200 to 1,500 pair populations with average productivity of 1.25 chicks per pair – showed, respectively, extinction probabilities of 35% and 31% over 100 years, and 95% and 92% probabilities of the population dropping below 500 pairs during the same time period.”

Attainment of the subpopulation goal for the Southern recovery unit is particularly important because of its current small size and sparse distribution over large geographic areas (USFWS, 1996).

A growing body of information shows that overwash-created and -perpetuated habitats, including inlets that are not artificially stabilized, inlets that have recently closed and remain undeveloped, and moist sparsely vegetated barrier flats are especially important to piping plover productivity and carrying capacity (Wilcox, 1959; Cairns, 1982; Strauss, 1990; Burger, 1994; Goldin and Regosin, 1998; Elias et al., 2000). In the Southern recovery unit, productivity and carrying capacity of Atlantic Coast piping plover breeding habitat is especially dependent on the availability of overwashes and naturally functioning inlets. Loegering and Fraser (1995) found that chicks on Assateague Island, Maryland that were able to reach bay beaches and the island interior had significantly higher fledgling rates than those that foraged solely on the ocean beach. Higher foraging rates, percentage of time spent foraging, and abundance of terrestrial arthropods on the bay beach and interior island habitats supported their hypothesis that foraging resources in interior and bayside habitats are key to reproductive rates on that site. Their management recommendations stressed the importance of sparsely vegetated cross-island access routes maintained by overwash, and the need to restrict or mitigate activities that reduce natural disturbance during storms. Dramatic increases in plover productivity and breeding population on Assateague since the 1991-92 advent of large overwash events corroborate Loegering and Fraser's conclusions. Piping plover productivity, which had averaged 0.77 chicks per pair during the five years before the overwash, posted an average of 1.67 chicks per pair in the years 1992 to 1996. The nesting population on the northern 5.0 miles of the island also grew rapidly, doubling by 1995 and tripling by 1996, when 61 pairs nested there (MacIvor, 1996). Habitat use data continues to show predominant use of interior and bayside habitats (NPS and MDNR, 1993-1997).

Texas Coast Populations

In 1992-1993, a study documented 602 plovers over 60 miles of south Texas beaches with 400 of these being found along the Gulf beach foreshore. Additional surveys have consistently documented over 100 plovers utilizing the MBCHC during a one day observation period. A consistent finding of all analyses of the demographic factors affecting the persistence and/or extinction of piping plover populations (Ryan et al., 1993; Melvin and Gibbs, 1994; Plissner and Haig, 2000) is that vulnerability to extinction is greatly increased by even small declines in survival rates. Modeling by Melvin and Gibbs (1994), for example, showed approximately four-fold increases in the likelihood of extinction of the Atlantic Coast piping plover population when survival rates of adults and juveniles declined by as little as 5 and 10 percent, respectively, and

other parameters were held constant. Since piping plovers spend 55 to 80 percent of their annual cycle associated with wintering areas, factors that affect their well-being on the wintering grounds will substantially affect their survival and recovery (USFWS, 1996).

All Populations

New Threats: Many future threats to this species' continued existence are similar to the current problems, including increased human and domestic animal disturbance, increased recreational pressures, increased development of beaches and shorelines, the construction of beach stabilization structures, and the prevention of overwash-created and -perpetuated habitats.

Barrier beach habitats preferred by both breeding and wintering piping plovers are dynamic, storm-maintained ecosystems, and much of this species' historic habitat along the Atlantic Coast has been destroyed or permanently degraded by development and human use. The construction of houses and commercial buildings on and adjacent to barrier beaches directly removes plover habitat and results in increased human disturbance. The impacts of shoreline development are often greatly expanded by the attendant concerns for protecting access roads. While legal restrictions on coastal development may slow the future pace of physical habitat destruction, the trend in habitat availability for this species is down.

A more subtle threat to the plover is the decrease in the suitability of the species' habitat due to accelerating recreational activity and development along the Atlantic Coast. Habitat loss occurs when suitable nesting sites are made unusable because high human and/or animal use precludes the birds from successfully nesting. Habitat loss can also occur when important wintering habitats are made unusable by increased man-made activities and operations (i.e., sand disposal, inlet dredging, etc.) which cause birds to flee protective habitats and use valuable energy reserves.

Human population growth along the United States coast creates an ever increasing demand for beach recreation. In 1993 only 32 percent of the U. S. Atlantic Coast population of piping plovers nested on Federally-owned beaches where at least some protection from development can be afforded. The remaining 68 percent of the birds nested on State, Town, or privately-owned beaches where they face increasing disturbance from recreationists and development. The situation in the plover's Atlantic Coast wintering range is similar; 37 percent of the shoreline recently proposed for designation as critical habitat for wintering piping plovers in North Carolina, South Carolina, and Georgia is Federally-owned, while 63 percent is in State and private ownership (65 FR 41782). Pressure from development and human disturbance on Atlantic Coast beach habitat continues, and the recovery plan emphasizes that piping plover habitat protection efforts must recognize and seek to perpetuate the natural dynamism of these barrier systems (USFWS, 1996).

The Atlantic Coast Piping Plover Recovery Plan (USFWS, 1996) calls for the protection of all known wintering habitat by preventing habitat degradation and disturbance, including direct and

indirect impacts of shoreline stabilization, navigation projects, and development, disturbance by recreationists and their pets, and contamination and degradation due to oil or chemical spills. In addition, the plan addresses the need to identify important migration stop-over habitat and mitigate any factors that may adversely affect these areas. Factors that must be considered include: (1) energetic depletion due to displacement of birds as a result of disturbance, even if alternative habitats are available; and, (2) short- and long-term effects on prey availability that can extend effects on habitat quality long after the completion of a given action.

e. Analysis of the species/critical habitat likely to be affected

Piping Plover

The proposed action has the potential to adversely affect overwintering and migrating plovers within the proposed project area. The effects of the proposed action on piping plovers will be considered further in the remaining sections of this opinion. Potential effects include harassment in the form of disturbing or interfering with plovers attempting to forage within the construction area or on adjacent beaches as a result of construction activities; behavior modification of migrating or wintering plovers due to disturbances created by the construction activities within the project area resulting in excessive energy expenditures or displacement of birds to unsuitable sites, increased foraging behavior, or situations where they choose marginal or unsuitable resting or foraging areas. The construction activities can also lead to diminished quantity and quality of intertidal foraging habitats within the action area, compared with flood tidal deltas at naturally functioning and migrating inlets resulting in decreased survivorship of nesting, migrating or overwintering plovers. However, it should be noted that the beach area within the project site is now J. B. Luby Park and currently receives heavy public traffic and use.

Environmental Baseline

Under section 7(a)(2) of the Act, when considering the effects of an action on Federally-listed species, the Service is required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and the past and present impacts of all Federal, State, or private actions and other human activities in the action area, including Federal projects in the action area that have already undergone section 7 consultation and the impacts of State or private actions which are contemporaneous with the consultation in process (50 CFR § 402.02).

The action area, for direct impacts, includes those sections of beaches and channel where sediment disposal and earthen manipulation will occur. The action area for indirect impacts is much larger than that for direct impacts. Because sea turtles and piping plovers are highly mobile species, animals influenced by direct project impacts may move great distances from the actual project site. For example, a piping plover that cannot forage on the intertidal flats of a project area beach due to the disposal of dredged material may fly many miles only to find that other suitable feeding sites are fully occupied or utilized by existing birds. The range of these

movements produced by the project constitute the action area for indirect impacts; for the purposes of this opinion it will be from the Nueces-Kleberg County Line north to the southern end of Mustang Island State Park.

Status of the species within the action area

Piping Plovers

Surveys have provided preliminary insight into their winter distribution and ecology, and contributed to the identification of specific wintering sites (Haig and Oring, 1985, Nicholls 1989, Nicholls and Baldassarre 1990a). Wintering plovers on the Atlantic Coast are generally found at the accreting ends of barrier islands, along sandy peninsulas, and near coastal inlets. Wintering piping plovers appear to prefer sand flats adjacent to inlets or passes, sandy mud flats along prograding spits, and overwash areas as foraging habitats. These substrate types may have a richer infauna than the foreshore of high energy beaches and often attract large numbers of shorebirds. Roosting plovers are generally found along inlet and adjacent ocean and estuarine shorelines and their associated berms and on nearby exposed tidal flats (Fussell, 1990; Nicholls and Baldassarre, 1990b). Diverse coastal systems may be especially attractive to plovers and may concentrate wintering piping plovers when roosting and feeding areas are adjacent (Nicholls and Baldassarre, 1990b).

Piping plovers tend to return to the same wintering sites year after year (Nicholls and Baldassarre, 1990a). The International Piping Plover Censuses of 1991 and 1996 located only 63% and 42% of the estimated number of breeding birds, respectively (Haig and Plissner 1993, Plissner and Haig, 1997). Of the birds located on the wintering grounds during these two censuses, 89% were found on the Gulf Coast of the United States.

In most areas, wintering piping plovers depend on a variety of sites distributed throughout the landscape. Annual, daily, and even hourly availability of habitat depends on local weather and tidal conditions, and piping plovers may leave sites if it becomes inundated by high tide, storm events, or if high winds or cold temperatures make the site unsuitable for foraging or roosting (USFWS, 2001). Therefore multiple surveys must be performed to increase quantitative and qualitative results in order to determine representative status of the piping plover assemblage in their habitat.

A number of documents have been published to account for the presence of wintering piping plover within the proposed project area. Table 3 represents information collected during the years of 1991 through 2002 and consists of data recorded during multiple surveys that demonstrates continual use patterns by piping plovers. These surveys include the International Shorebird Survey, the 1991, 1996, and 2001 Piping Plover Censuses, and another survey performed in 2002.

The International Shorebird Survey took place primarily within the piping plover wintering

and/or migration period during the months of July through May, from 1996 through 2000. A total of 50 days of surveys were conducted as weather and timing allowed throughout the 4-year period. Results from this survey represents the total number of birds seen throughout the survey period, and the maximum numbers of birds seen in one day.

Results from the 1991 and 2001 Piping Plover Censuses, illustrates fidelity of wintering grounds to migrating piping plover. Previous to the 1996 census, the passage of a strong cold hampered survey attempts as water was pushed out into the Gulf of Mexico and the birds may have sheltered away from known piping plover habitat sites or were widely distributed because of the expanse of emergent habitat. Every five years, this one-day survey to document the presence of the wintering population of the piping plover is performed from North Carolina to the southern tip of Texas.

Another survey to document shorebird use was performed at three areas within the proposed project area relative to Newport Pass. Eight days of surveying was performed to access presence of piping plover within a maintained beach vs. an un-maintained beach area within 1.6 kilometers north and south, and within the area designated as Newport Pass.

Sea Turtles

Five species of federally listed threatened and endangered sea turtles, including loggerheads, greens, Kemp's ridleys, hawksbills and leatherbacks, are found in Texas coastal waters. Sea turtle stranding data for the Texas coast during 2002 included a total of 112 loggerheads, 45 greens, 97 Kemp's, 17 leatherbacks, 45 hawksbills and 8 unidentifiable specimens. Various life stages of these turtles migrate through, and sometimes reside in, waters off the coast and near the passes between the Gulf of Mexico and the bays, at least during some parts of the year. Additionally, juvenile Kemp's ridleys and green turtles are known to use northern and southern Texas passes and bays, respectively, as developmental habitat.

Female Kemp's ridleys have nested within the action area. Between 1988 and 2002, three nests of the endangered Kemp's ridley sea turtle were found on the Gulf beach within the delineated action area (Figure 6). On May 29, 1995, a Kemp's ridley nest was found 100 meters south of Access Road #3 on Mustang Island. In 2002, one nest was located on May 18 at a site 0.75 miles north of Bob Hall Pier, while a second nest was found at the Nueces/Kleberg County line on July 7.

In addition to the sea turtle nests within the action area itself, adjacent stretches of beach to the north and south also hosted nesting sea turtles, according to records kept between 1988 and 2002. There were 11 additional Kemp's ridley and 3 loggerhead sea turtle nests documented within 10 miles to the north of, and 3 miles to the south of, the action area boundaries. The Kemp's ridley nests were laid between the months of April through June, while the loggerhead nests were laid between May and June. The nesting season for Kemp's ridley typically falls between the beginning of April through the end of June. The loggerhead nesting season extends from mid-

May through August, and possibly into September. The green nesting season usually begins in June through the end of July.

If numbers of nesting turtles in 2002 was any indication, nesting Kemp's ridley sea turtles may be on the rise along the Texas coast. The 38 nests found in 2002 more than doubled the number found in any previous year. Also, the 2002 distribution of nests encompassed a wider distance along the Texas coast than seen in any previous year's records. Kemp's ridley nests were found from the most southern Texas beach, Boca Chica, all the way to Galveston Island on the northern coast of the state. The largest concentrations of nests found, however, continued to be concentrated on North Padre Island, and to some extent on Mustang Island.

Some fidelity to nesting sites has been shown by Kemp's ridleys (pers. comm. D. Shaver to R. Cobb 2003 USGS, Burchfield, et. al., 2002), both within one nesting season, and between nesting seasons. If conditions are unsuitable on a nesting beach or the female is disturbed, she has some capacity to return to the water and to attempt to nest elsewhere within a short distance from the first site (within several kilometers to the north or south).

There are a few records of juvenile Kemp's ridleys occurring in the bay waters in proximity to the action area (D. Shaver, USGS, pers. comm. 2003, USACE, 1985). National Marine Fisheries Service (NMFS) released 96 juvenile "headstarted" Kemp's ridleys in Nueces Bay in 1983, and another 172 were released off Mustang Island in 1984. The NMFS subsequently reported 14 recaptures of immature Kemp's ridleys in the adjacent bay system between 1981 and 1983, with two of these recaptures at the southeastern end of the bay (USACE, 1985). Young green sea turtles are frequently seen in the northern portions of the Upper Laguna Madre, including the action area (D. Shaver, pers. comm., 2003). Historically, young green sea turtles were the most abundant species within central and southern Texas bays. Green sea turtles have been documented using jettied passes of the southern Texas coast (Shaver, 2000).

In the long term, if turtle nesting numbers continue to rise, it is likely that some females will come ashore both within the immediate action area and in areas to the north and south where development may have been stimulated by the channel opening. This nesting activity could be adversely impacted within and adjacent to the action area.

Factors affecting species environment within the action area

A wide range of past, recent and on-going beach disturbance activities have altered the proposed action area and, to a greater extent, the Texas coast. Nourishment activities widen beaches, change their sedimentology and stratigraphy, alter coastal processes and often plug dune gaps and remove overwash areas. Inlet dredging activities alter the sediment dynamics on adjacent shorelines and stabilize these dynamic environments; beach disposal of dredge material further alters the natural habitat adjacent to inlets. Beach scraping, which has increased in frequency in recent years, can artificially steepen beaches, stabilize dune scarps, plug dune gaps, and redistribute sediment distribution patterns. Artificial dune building, often a product of beach

scraping, removes low-lying overwash areas and dune gaps. As chronic erosion catches up to structures throughout an action area, artificial dune systems are constructed and maintained to protect beachfront structures either by sand fencing or fill placement. Inlet stabilization projects, such as jetties and groins, reduce the dynamism of overwash areas adjacent to inlets. Estuarine dredging of navigational channels can alter water circulation patterns and sediment transport pathways, as well as increase the frequency and magnitude of boat wakes; sound-side sand or mud flats may be impacted by increased erosion rates as a result. Excessive recreational use of beaches and flats may also pose a threat to the species utilizing these habitats by making them unsuitable or dangerous. The jetties may become an area around which green and ridley sea turtles congregate at certain times which could increase potential boat strikes and other recreational activities such as discarded debris, fishing line and baited hooks could impact the turtles themselves.

The action area can be accessed by vehicle, on foot or by boat. Land ownership within the action area is both public and private. Several private developments have COE permit applications currently being reviewed. They include Commodore's Cove II site, located roughly one mile south of Packery Channel and 4,000 feet east of the GIWW, The Village, located roughly 2,000 feet south of Packery Channel and 2,000 feet east of the GIWW, Frye dredge bulkhead and the City's dredged placement areas for this project.

Development increases the potential for piping plovers and sea turtles to be impacted by loss of habitat, or interference in the roosting, resting and foraging activities of wintering piping plovers or loss of nesting sea turtle habitat or intervention of nesting activities. The presence of predator species such as coyotes, raccoons, and opossums that are common mammalian wildlife within the immediate and extended project may increase as garbage increases.

All of these actions or factors may have adverse effects on sea turtles and wintering, non-breeding, piping plovers by destroying, diminishing, or altering the habitats on which they depend.

I. Effects of the Action: Sea Turtles

Beneficial effects:

The placement of dredged sediments on a beach may increase sea turtle nesting habitat if the material is highly compatible (i.e., grain size, color, shape, etc.) with naturally occurring sediments.

Direct effects:

Construction and Dredging - New construction and dredging associated with Packery Channel will result in the permanent loss of approximately 2.1 acres of nesting sea turtle habitat. The placement of new work and maintenance dredge material on both PA 4S and PA 4N

approximately every two years will temporarily impact approximately 55.4 acres of sea turtle habitat. Potential effects include destruction of undetected nests deposited within the boundaries of the proposed project and harassment in the form of disturbing or interfering with females attempting to nest within the project area or on adjacent beaches as a result of construction activities.

Beach nourishment - Although beach nourishment potentially may increase the sea turtle nesting habitat in an area, significant negative impacts to sea turtles may result if protective measures are not incorporated during construction. Nourishment during the nesting season, particularly on or near high density nesting beaches, can cause increased loss of offspring from human-caused mortality and, along with other mortality sources, may impact the long-term survival of the species. For instance, projects conducted during the nesting and hatching season could result in the burial or crushing of undetected nests or hatchlings or loss of sea turtles through disruption of nesting activity. While a nest monitoring and/or egg relocation program would likely reduce these impacts, nests may be inadvertently missed or misidentified as false crawls during daily patrols. Under the best of conditions, approximately 7 percent of nests are misidentified as false crawls by experience sea turtle nest surveyors (Schroeder, 1994), thus these nests could be impacted by the project.

Equipment - The placement of pipelines and the use of heavy machinery on the beach during a construction project may also have adverse effects on sea turtles. They can create barriers to nesting females emerging from the surf and crawling up the beach, causing a higher incidence of false crawls and unnecessary energy expenditures.

Artificial lighting - Another impact to sea turtles is disorientation (loss of bearings) and misorientation (incorrect orientation) of hatchlings from artificial lighting. Visual cues are the primary sea-finding mechanism for hatchlings (Mrosovsky and Carr, 1967; Mrosovsky and Shettleworth, 1968; Dickerson and Nelson, 1989; Witherington and Bjorndal, 1991). Artificial beachfront lighting is a well documented cause of hatchling disorientation and misorientation on nesting beaches (Philbosian, 1976; Mann, 1977). In addition, research has also documented significant reduction in sea turtle nesting activity on beaches illuminated with artificial lights (Witherington, 1992). Therefore, construction lights along a project beach and on the dredging vessel may deter females from coming ashore to nest, disorient females trying to return to the surf after a nesting event, and disorient and misorient emergent hatchlings from adjacent non-project beaches. Any source of bright lighting can profoundly affect the orientation of hatchlings, both during the crawl from the beach to the ocean and once they begin swimming offshore. Hatchlings attracted to light sources on dredging barges may not only suffer from interference in migration, but may also experience higher probabilities of predation to predatory fishes that are also attracted to the barge lights. This impact could be reduced by using the minimum amount of light necessary (may require shielding) or low pressure sodium lighting during project construction.

Indirect effects:

Changes in the physical environment - Many of the direct effects of beach disposal may persist over time and become indirect impacts. These indirect effects include future sand migration, changes in the physical characteristics of the beach, the formation of escarpments, and the consequences of increased beachfront development.

If the material placed on the beach is dissimilar from the original beach sand, sediment disposal may result in changes in sand density (compaction), beach shear resistance (hardness), beach moisture content, and beach slope (Nelson and Dickerson, 1988a). Physical characteristics of the sand such as color, grain size, grain shape, and grain mineral content may also be changed. These changes could result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings (Nelson and Dickerson, 1987; Nelson, 1988).

Beach compaction and unnatural beach profiles that may result from beach disposal activity could negatively impact sea turtles regardless of the timing of projects. Very fine sand and/or the use of heavy machinery can cause sand compaction on nourished beaches (Nelson et al., 1987; Dickerson, 1987; Nelson and Dickerson, 1988a). Significant reductions in nesting success (i.e., false crawls occurred more frequently) have been documented on severely compacted nourished beaches (Fletemeyer, 1980; Raymond, 1984; Nelson and Dickerson, 1987; Nelson et al., 1987), and increased false crawls may result in increased physiological stress to nesting females. Sand compaction may increase the length of time required for female sea turtles to excavate nests and also cause increased physiological stress to the animals (Nelson and Dickerson, 1988b).

After discussions with the COE and the City, these impacts will be minimized by using suitable sand and by tilling the beach after nourishment prior to the next sea turtle nesting season each year of the life of the project. Tilling of a nourished beach should reduce the sand compaction to levels comparable to unnourished beaches. A root rake with tines at least 42 inches long and less than 36 inches apart pulled through the sand is recommended for compacted beaches.

A change in sediment color on a beach could change the natural incubation temperatures of unlocated nests within an area, which, in turn, could alter natural sex ratios. To provide the most suitable sediment for nesting sea turtles, the color of the nourished sediments must resemble the natural beach sand in the area. Natural reworking of sediments and bleaching from exposure to the sun would help to lighten dark nourishment sediments; however, the timeframe for sediment mixing and bleaching to occur could be critical to a successful sea turtle nesting season. The COE and the City have agreed that only sand of similar type and composition will be used for beach nourishment.

Escarpments - On nourished beaches, steep escarpments may develop along water line interfaces as the beaches adjust from the unnatural, construction profile to a more natural beach profile (USACE, 1984; Nelson et al., 1987). These escarpments can hamper or prevent access to nesting sites. Researchers have shown that female turtles coming ashore to nest can be discouraged by the formation of an escarpment, leading to situations where they choose marginal or unsuitable

nesting areas to deposit eggs (e.g., in front of the escarpments, which often results in failure of nests due to prolonged tidal inundation). This impact will be minimized by tilling any escarpments prior to the sea turtle nesting season.

Unchecked Beach Erosion - Periodic sand bypassing appears to control beach erosion only when considered on an exact year-to-year basis. If the net sediment transport is less than the average mechanical bypassing volume of sand needed to maintain current beach position no sand bypassing will take place during that year because shorelines are anticipated to remain stable. Therefore, bypassing could, in fact, be delayed for several years. The deferral of bypassing could leave the beach in poor condition during the winter storm season and summer hurricane season, unless emergency bypassing operations were initiated. The replacement of the natural, continuous flow of sand on and off area beaches with the transfer of the entire littoral drift at intervals of one or more years will diminish the value of these beaches as sea turtle nesting habitat. If unchecked erosion would exist through most of sea turtle nesting season, an undetected nest established above the high tide line could also be washed away before incubation is complete. Small, localized, erosional "hot spots" that would not trigger emergency bypassing could be harmful to sea turtle nests. However, the COE and City have stated that periodic dredging (potentially every 2 years) will be used for beach erosion control, thus minimizing this potential impact.

Development/Recreation - Beach disposal of project dredge material would constitute a form of beach nourishment within the project area. Pilkey and Dixon (1996) write that beach replenishment frequently leads to more development in greater density within shorefront communities that are then left with a future of further replenishment or more drastic stabilization measures. Dean (1999) also notes that the very existence of a beach nourishment project can encourage more development in coastal areas. Increased building density immediately adjacent to the beach often resulted as older buildings were replaced by much larger ones that accommodated more beach users. Increased shoreline development may adversely affect sea turtle nesting success. Greater development may support larger populations of mammalian predators, such as coyotes, raccoons, and opossums, than undeveloped areas (NRC, 1990), and can also result in greater adverse effects due to artificial lighting, as discussed above. Again it should be noted that the beach portion of the action area is now J.P. Luby Park and is heavily used by the public.

Analysis for Effects of the Action: Piping Plovers

In an effort to better define project direct and indirect impacts, the Service calculated number of acres to be permanently and temporarily disturbed using GIS data provided by the COE. The acreage differs from the estimated amount of impact identified by the COE in their DEIS and Final BA. Impacts are defined in number of acres of piping plover habitat vs. number of acres of piping plover critical habitat to be directly or indirectly impacted, as well as number of acres of nesting sea turtle directly impacted vs. indirectly impacted.

Beneficial effects:

The Service is not aware of any beneficial effects of the action within the project area for piping plovers.

Direct effects:

Construction and Dredging - New construction and dredging associated with Packery Channel construction will result in the permanent loss of approximately 8.2 acres of piping plover habitat of which approximately 2.1 acres is in designated critical habitat. Total indirect impacts to piping plover habitat resulting from new work and maintenance dredge material being placed on PA 4S and PA 4N totals approximately 57.3 acres of which approximately 31.6 acres is within critical habitat TX-7. Both sites will be temporarily disturbed by placement of material approximately every two years. The disposal operation would extend through most of the piping plover wintering season of each year during the construction phase (approximately 30 months) and maintenance phases (estimated every 2 years) for the life of the project, 50 years.

Beach nourishment - Repetitive beach disposal of dredge sediments is likely to adversely affect beach invertebrate populations, a food source for piping plovers. These populations are a key facet of the coastal food web, and therefore decreased species abundances would reduce the prey base for shorebirds, surf fishes, and beach invertebrate macrofauna. Once maintenance dredging begins, beach within PA 4S and PA 4N may receive additional sand disposal on a 2- year cycle for approximately 50 years. This periodic beach disposal of dredged material over many years may permanently depress beach invertebrate populations. The project may reduce foraging habitat for migrating and overwintering plovers. Piping plovers that cannot find sufficient food within the project area would be forced to move to feeding sites outside the actual sediment disposal areas. The displacement of birds from the project area could also negatively affect nearby birds by congregating animals in areas and reducing available feeding or roosting habitats.

A study on North Carolina's Outer Banks beaches found that the timing of beach fill placement, the time interval between fill placement episodes, the size and type of fill, and the compatibility of the fill material to the native sediments are critical to the short- and long-term impacts to beach invertebrate populations (Donoghue, 1999). Fill placement during the invertebrate reproduction or recruitment periods in early spring and early fall depressed the populations of mole crabs (*Emerita talpoida*) and coquina clams (*Donax variabilis*) for several months to years; ghost crab (*Ocypode quadrata*) populations were similarly reduced as a result of fill placement on the beaches at Pea Island. The alterations to the geomorphology and sediment characteristics of the study beaches appear to be greater controlling factors on invertebrate recovery periods than direct burial or mortality. Further, sand flowing onto the lower portion of the beach during the nourishment operation can increase the beach height in the intertidal zone from several centimeters to more than a meter (NRC, 1995). This significant change in the character of the intertidal zone can affect habitat suitability and feeding by beach invertebrates beyond the immediate impact of sediment placement.

Beach invertebrates may take a year or more to recover from beach disposal (Reilly and Bellis, 1978; Donoghue, 1999). The long term impacts of these repetitive sand placements on beach invertebrates and the shorebirds which feed on them are uncertain, but are most likely to result in degradation of habitat value. Impacts on piping plover survival rates are likely to be more severe during periods of peak energetic demand during migration, and during and after harsh winter weather. The impacts of beach nourishment from this project will be minimized by utilizing only similar material to that naturally found on the beach. Beach nourishment is anticipated to occur once every 2 years and will impact less than 20 acres every other year.

Equipment - Heavy machinery and equipment (e.g., trucks and bulldozers operating on project area beaches, the placement of the hydraulic pipeline along the beach, and sand disposal) may also adversely affect migrating and overwintering piping plovers by disrupting normal beach uses such as resting and feeding, causing birds to expend valuable energy reserves. The loss of the use of this habitat could minimize the available habitat necessary to sustain overwintering birds, forcing them to seek suitable habitat outside of the project area. The displacement of these birds could, in turn, affect areas in which other birds exist by reducing their available roosting and/or foraging habitat. In addition, beaches that have recently received sand could have fewer invertebrates as a food source than natural beaches. Again it should be noted that the beach portion of the action area is now J.P. Luby Park and is heavily used by the public.

Indirect effects:

Changes in the physical environment - Opening the pass eliminates the occurrence of overwash areas that are created by the flow of water through the primary dry dune line. Overwash areas provided valuable roosting habitat for piping plovers. Water flowing through the dune deposits sand on barrier flats and marshes depending on the storm magnitude and the width of the beach. Cross island overwashes can create intertidal bayside flats that are valuable shorebird foraging habitats and birds may feed on those portions that stay moist (USFWS, 1996). Therefore, a reduction in the creation of overwash areas would also adversely affect piping plovers.

Development/Recreation - It is likely that future development within the project area will increase. Piping plovers may also be adversely affected by future development, increased commercial and recreational use of the inlet and by increased human and pet traffic disturbance.

Analysis for Effects of the Action: Piping Plover Critical Habitat Units TX-6 and TX-7

Critical habitat identifies specific areas that are essential to the conservation of a listed species. TX-6 and TX-7 area designated critical habitat units that contain primary constituent elements that are essential for the primary biological needs of foraging, sheltering and roosting of the piping plover and may require special management considerations or protection.

TX-6 Mollie Beattie Coastal Habitat Community

The MBCHC is owned and managed by the TGLO. It consists of 1,100 acres of which 596 acres is designated critical habitat for the piping plover. Within this unit are two hurricane washover passes known as Newport and Corpus Christi Passes, and wind tidal flats that are infrequently inundated by the effect of seasonal winds. Uplands that are not densely vegetated are used for roosting by the piping plover.

Modeling runs using the existing Texas Water Development Board (TWDB) model were provided in July 2002. August 1991 data on real tides and winds was used to run the model. In September, at the request of the Service and other resource agencies, the model was modified in an effort to alleviate concerns of potential future impacts occurring to MBCHC as a result of the proposed project. The model was modified to include existing parts of the Packery Channel that were not part of the original TWDB model and provided an actual "with Packery Channel" and "without Packery Channel" comparisons. Currently without Packery Channel there was a small tide range because it was part of a dead-end canal. With the construction of Packery Channel the model indicated the Gulf tide influence would create shifts in both tidal phase and tidal amplitude (Figure 7, 8).

Due to the low elevation of the area the Service interprets these changes to be potentially significant. Sand from low lying tidal flats directly adjacent to a channel dredged to 5-6 feet will likely accrete into the channel. With the additional changes in tidal amplitude and phase, more sand is expected to move as particle velocity will be higher. This outcome could potentially fill the channel over time and could potentially decrease tidal flat area or cause it to accrete shoreward. A short-term shift may occur and piping plovers may still be able to use the habitat; however long-term maintenance dredging of the channel and continued boat activity potentially may cause the loss of the tidal flats in the immediate area of Packery Channel and within the boundaries of the MBCHC critical habitat unit currently used by piping plovers.

The URS report prepared for the COE, entitled "Erosion Protection Design" prepared, by using a different model, indicated water velocity in the channel would exceed well over 3.00 fps during different seasons of the year. The report concluded that the velocity of water in the channel would be high enough to warrant scour protection for the existing bridges like the one at SH 361. The Service interprets this to mean, if the water velocities are high enough to warrant protection for a stationary concrete bridge, the same water velocities would cause loose sand adjacent to the bridge to erode into the channel be dredged and/or and washed out into the Gulf. This enforces the Service's concern that tidal flats in MBCHC, which is just north of the bridge and abuts the channel, could potentially be reduced in size or adversely modified over time.

The change in tidal regime and tidal currents could also result in tidal scour leaving tidal flats with a steep edge rather than a very gradual one. Increase in amplitude is likely to cause flats to be less frequently exposed or not exposed at all. Decreased amplitude, particularly during the fall high tides, when the majority of invertebrate recruitment occurs, could result in flats not be inundated frequently enough or long enough for invertebrate communities to become well-established (pers. comm, Dr. Kim Withers, TAMUCC, 2002).

Piping plovers are sight foragers, forage in areas relatively distant from the edge of the water, need exposed damp or dry areas to forage in and do not seem to forage successfully in an area that is covered with more than a very thin film of water. Increased amplitude could potentially cause a narrowing of the area available for foraging, and reduce the size of drier areas. Decreased amplitude may result in more frequent exposure of flats however, it may not necessarily increase the size of available habitat because flooding is needed to provide recruits and sustain the invertebrate population (pers. comm., Kim Withers, TAMUCC, 2002). The consistent change in tidal amplitude could also result in changes in vegetation making it unsuitable to the piping plover.

The Service, using aerial photography selected tidal flats along the channel and within MBCHC that could potentially be impacted over time by the change in tidal regime and tidal currents once Packery Channel has been constructed (Figure 9). A total of approximately 62 acres were identified by the Service as being at risk of being adversely impacted and potentially degraded by changes in vegetation, loss of area, or accreting shoreward to the Gulf. A total of approximately 22 acres were identified as being likely to be adversely impacted over time but not as severely.

These potential future impacts, if not appropriately monitored and, (if warranted) corrective action taken, could result in adverse effects that would appreciably diminish the over all value of the entire designated critical habitat unit. However, without establishing a baseline with appropriate monitoring it would be difficult to determine whether any potential negative occurrences at MBCHC were a result of the project.

Modeling Resolution

Modeling of the proposed project was undertaken by the COE to address potential impacts of changes in salinity, hydrology, and tidal amplitude. The data have been interpreted differently by the COE and the Service. The impact of the new channel will be felt most prominently from the Gulf to the bridge at SH 361, as would be expected. This part of the channel is armored up to and including the bridge for this reason. Shortly west of the SH 361 bridge (approximately at Station 120+00 to 130+00), the channel opens into a much larger embayment and is no longer confined. Velocity slows significantly, as would potential scour and erosion. The model utilized by PBS&J however, assumed vertical, confined sides of the channel through this reach of the project from SH 361 to the GIWW, thus exaggerating the impacts generated by the model. This is in fact not what will be constructed. There will be no confinement or armoring of the channel in this part of the project area. Current and tidal amplitude will rapidly decline once the large expanse of open water of MBCHC embayment is reached. In interpreting these data, the COE concluded that the actual, real-world impacts would be significantly less than the model generated data seem to indicate, and that there will be no or minimal hydrological impacts to MBCHC. The Service has adopted a literal assumption of the data, and conclude that impacts to MBCHC may be significant. Because a resolution of data interpretation could not be achieved, the City agreed as part of it's lease agreement for project lands from the TGLO, to conduct a five year monitoring program to determine actual project impacts, if any, to MBCHC.

The purpose of this agreement is to provide a mechanism to monitor any adverse effects that the project might have on MBCHC by undertaking the monitoring program which was adopted and incorporated by reference into the MOU, determine any mitigation measures that may be needed, and establish procedures for undertaking the mitigation measures. The City has agreed, as permissible under State law, to fund the monitoring plan, counter, mitigate, and resolve any significant negative effects that are caused by the project, including but not limited to, increased vessel traffic. Costs have been estimated, the City is raising its' portion of project funding by issuing bonds and monitoring of MBCHC will be paid for from that source of funds.

MBCHC also encompasses Newport Pass. This area has been documented as a largely utilized area by piping plovers for roosting, as well as other shorebirds. PA 4N extends to Newport Pass and any staging of equipment or alterations to the immediate area may impact plovers. The Service recommends no staging areas be placed at Newport Pass.

TX-7 Newport Pass/Corpus Christi Pass Beach

This unit is along a stretch of Gulf beach 5.3 miles long. It extends from Fish Pass to the north to St. Bartholomew Avenue on the south. It includes lands known as wind tidal flats and are infrequently inundated as an effect of seasonal winds. PA 4N and PA 4S are both located in this critical habitat unit. Piping plovers forage mostly on benthic invertebrates, insects, and crustaceans found within the inter-tidal areas of ocean beaches. Sediment placement and nourishment activities are likely to diminish populations of benthic organisms. Monitoring and proper coordination of these activities is important to ensure that benthic organisms have had time to recuperate after such events and foraging areas are not reduced for the piping plover. Although not established, piping plovers seem to show considerable site fidelity.

I. Species' Response to the Proposed Action

Sea Turtles

Ernest and Martin (1999) conducted a comprehensive study to assess the effects of beach nourishment on loggerhead sea turtle nesting and reproductive success. The following findings illustrate sea turtle responses to and recovery from a sediment disposal project. A significantly larger proportion of turtles emerging on nourished beaches abandoned their nesting attempts than turtles emerging on control or pre-nourished beaches. This reduction in nesting success was most pronounced during the first year following project construction and is most likely the result of changes in physical beach characteristics associated with the sediment disposal project (e.g., beach profile, sediment grain size, beach compaction, frequency and extent of escarpments). During the first post-construction year, the time required for turtles to excavate an egg chamber on the untilled, hard-packed sands of one treatment area increased significantly relative to control and background conditions. However, in another treatment area, tilling was effective in reducing sediment compaction to levels that did not significantly prolong digging times. As natural processes reduced compaction levels on nourished beaches during the second post-construction

year, digging times returned to background levels. To minimize the above potential impacts, the City has agreed to beach tilling prior to the sea turtle nesting season on those areas which beach nourishment has occurred, utilizing only similar material in the nourishment action, and all beach nourishment activities will occur outside the nesting season.

Piping Plover

Limited information is available on the specific effects of dredge and disposal projects on , migrating and wintering piping plovers. Most research has focused on the general impacts of human disturbance (e.g., Burger, 1991; 1994; Collazo et al., 1995), or other measurable impacts to resources used by plovers (e.g., Reilly and Bellis, 1978; Donoghue, 1999). However, the results of human disturbance are closely related to the indirect effects of a dredge and disposal project on piping plovers. Habitat loss and disturbance associated with human development are the most frequently cited causes of the decline of the species. The construction of recreational, residential, and commercial structures not only physically alters or covers the habitat, but the increase in human and pet and feral animal use of the beaches generates greater disturbance of plovers using those habitats.

In general, coastal development and stabilization activities degrade roosting and foraging habitats used by piping plovers by altering the natural processes of beach dune and inlet erosion and accretion

V. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

While some future beach nourishment may be funded by State or local governments or private groups, the Service is not aware of any specific projects under consideration within the action area. One known additional action may occur within the action area in the future which is the City's proposed improvements within the Packery Channel footprint and J.P. Luby Park. The improvements will include parking lots and access roads, a pavilion, walkways along the channel and on the jetties with access ramps and stairs, vendor kiosks, a bath house/restroom facility, boat ramps, underground utility crossing and a J. F. K. Causeway Area Access Point and Packery Point Park.

Maintenance or construction activities by private individuals or local groups and governments who may feel compelled to improve or provide protection to their properties within developments on the bayside of the action area or within canals found along their properties. However, these activities are not anticipated to impact the nesting sea turtles and/or piping plovers because of lack of existing habitat in these areas.

IV. Conclusion

After reviewing the current status of the above species and critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's Biological Opinion that the proposed North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel) (PL 106-53), is not likely to jeopardize the continued existence of the listed species under the Service's jurisdiction and is not likely to destroy or adversely modify their designated critical habitat. In evaluating the potential that this action constitutes destruction or adverse modification of critical habitat, the Service has evaluated whether the action will appreciably diminish the value of the designated critical habitat for the recovery of the listed species (see Consultation History section). For the piping plover, the adverse effects that may occur to the critical habitat would not appreciably diminish the value of the entire designated critical habitat area in providing for either the long-term survival or the recovery of the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the COE so that they become binding conditions of any grant or permit or project agreement issued to the City of Corpus Christi, as appropriate, for the exemption in section 7(o)(2) to apply. The COE has a continuing duty to regulate the activity covered by this incidental take statement. If the COE (1) fails to assume and implement the terms and conditions or (2) fails to require The City of Corpus Christi to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the COE or the City of Corpus Christi must report the progress of the action and its impacts on the species to the Service as specified in the incidental take statement (50 CFR § 402.14(i)(3)).

Amount or Extent of Take Anticipated

Piping Plovers

The Service anticipates incidental take of non-breeding piping plovers will be particularly difficult to detect because: (1) migrating and wintering plovers are not as easy to identify as breeding birds because they lose some of the markings associated with their breeding plumage and often congregate with other similar looking shorebirds; (2) the effects of intraspecific competition are difficult to measure and, (3) reduction in reproductive success on the breeding grounds will be difficult to measure if the plover on the wintering grounds is unidentifiable (no bands present).

However, the level of take of these species can be anticipated by the loss and disturbance of suitable piping plover beach habitat because: (1) piping plovers forage, roost and rest within the project site and (2) sediment disposal will likely occur during a portion of the winter and migrating season.

The Service anticipates the permanent loss of approximately 8.3 acres piping plover beach habitat because of channel construction and the temporary impact of approximately 57.3 acres of foraging and roosting piping plover beach habitat approximately every 2 years during beach sediment disposal and nourishment activities within PA 4N and PA4S. A total of approximately 2.1 acres of designated critical habitat within TX-7 will be directly and permanently impacted. A total of approximately 31.6 acres of designated critical habitat acre within the TX-7 critical habitat unit will be temporary disturbed by new work and maintenance dredge material being placed at PA 4N PA 4S (Figure 10, 11).

Based on the review of biological information and other information relevant to this action, take is anticipated in the form of:

1. Harassing, disturbing, or interfering with piping plovers attempting to migrate, forage rest, or roost within the project area or on adjacent beaches as a result of construction activities and subsequent maintenance activities; sand placement; and increased recreational, pedestrian, or animal traffic.
2. Behavior modification of piping plovers during the migrating and wintering seasons due to disturbances associated with construction activities and subsequent maintenance activities within the project area, resulting in excessive energy expenditures, displacement of individual birds, increased foraging behavior, or situations where they choose marginal or unsuitable resting or foraging areas.
3. Decreased survivorship of migrating and wintering piping plovers due to diminished quantity and quality of foraging habitats at the newly created inlet, compared with flood tidal deltas at naturally functioning and migrating inlets.

4. Modification of the hydrology, beach slope, and habitats utilized for feeding and roosting by the plovers.

The Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 USC § 703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

Sea Turtles

The Service anticipates incidental take of sea turtles will be difficult to detect for the following reasons: (1) turtles nest are difficult to find, especially for greens and loggerheads that are primarily nocturnal nesters, (a) natural factors, such as rainfall, wind, and tides may obscure crawls, and (b) human-caused factors, such as pedestrian traffic, may obscure crawls, and result in nests being destroyed because they were missed during a nesting survey and egg relocation program; (2) the total number of hatchlings per undiscovered nest is unknown; (3) the reduction in percent hatching and emerging success per relocated nest over the natural nest site is unknown; (4) an unknown number of females may avoid the project beaches and be forced to nest in a less than optimal area; and (5) lights may disorient an unknown number of hatchlings and cause death.

However, the level of take of these species can be anticipated by the loss and disturbance of suitable turtle nesting beach habitat because: (1) turtles nest within the project site; (2) sediment disposal during the construction phase will likely occur during a portion of the nesting season; (3) the sediment disposal project will modify the incubation substrate, and beach slope, and, (4) artificial lighting will disorient nesting females and hatchlings.

The Service anticipates the permanent loss of approximately 2.1 acres of nesting sea turtle beach habitat due to channel construction. Total of 55.4 acres of nesting sea turtle habitat will be indirectly impacted from new work and maintenance dredge material being placed on PA 4S and PA 4N. Approximately 20 acres or less is anticipated to be temporarily disturbed by placement of material approximately every two years (Figure 12).

Based on the review of biological information and other information relevant to this action, incidental take is anticipated in the form of:

1. Destruction of all sea turtle nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project during the construction phase.
2. Harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities.

3. Disorientation of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting.
4. Behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs.

Incidental take is not authorized for a known sea turtle nest that is left in its original location (i.e. not relocated) and is subsequently lost due to beach erosion. Such loss would include both the actual loss of the substrate containing the nest and destruction due to inundation by the ocean. Such a loss would indicate the COE was unable to control excessive erosion between bypassing operations.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to Kemp's Ridley, loggerhead and green sea turtles, or the piping plover or appreciably diminish the value of the entire TX-6 or TX-7 designated critical habitat area in providing for either the long-term survival or the recovery of the species.

REASONABLE AND PRUDENT MEASURES

Reasonable and Prudent Measures: All Species

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of the loggerhead, Kemp's ridley and green sea turtles, and the piping plover:

1. The City, in coordination with the COE and the Service, will devise and implement plans, to ensure contractors, employees, city officials and others fully understand the protection measures detailed in this opinion to avoid and minimize impacts to nesting sea turtles and wintering piping plovers prior to, concurrent with, and following the initial channel construction and all beach disposal activities.
2. To the extent consistent with the location, scope, duration, and timing of the operations, the initial channel construction and all beach disposal of sediments the City and COE will not, to the maximum extent possible, conduct activities during the wintering piping plover or nesting sea turtle seasons. However, if such activities are necessary to be performed during those times, a program to monitor their presence and use of the project area prior to, concurrent with, and post construction will be developed in coordination with but not limited to the City, COE and the Service.

3. The City in coordination with the COE and the Service, will devise and implement a plan to minimize the impacts to wintering piping plovers and nesting sea turtles during the initial construction phase and sediment placement to include: (1) minimizing the amount of heavy equipment in the project area at any given time; (2) not storing heavy equipment within the project area; and, (3) minimizing the spatial extent of the work area.
4. From March 15 through September 15, all lighting associated with the project will be coordinated with the Donna Shaver, the USGS Sea Turtle Coordinator at Padre Island National Seashore or the Service to reduce the possibility of disorienting nesting sea turtles and/or hatchlings from an unlocated nest.
5. The City and COE in coordination with the Service will ensure minimal disturbance to adjacent critical habitat areas not necessary for construction or staging activities.
6. A summary report from the COE or the City describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Service's Corpus Christi Ecological Services Field Office within 60 days of completion of the construction phase and following each maintenance phase, inclusive of the years between each operational event or other proposed work activity that has occurred for the life of the project.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the COE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

For all species:

1. The COE and/or the City will coordinate with the Service on the timing of surveys, turtle patrols and, any methodology for selecting areas to be surveyed. If deemed appropriate, based on collected data or new information, the Service can make the decision to end or modify the piping plover or sea turtle monitoring program.
2. The City and the COE shall ensure that the surveys and monitoring programs are adequately funded.

Sea Turtles

1. Training

The City and the COE shall arrange a meeting between representatives of the contractor, the Service, and Donna Shaver, USGS Sea Turtle Coordinator, for training at least 60

days prior to the commencement of work on this project. At least 10 days advance notice shall be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures which may include as needed or appropriate to be determined by the Service and the USGS Sea Turtle Coordinator. Examples may include:

- a. An awareness training for City employees and contractors will include: identification of tracks, notification methodology, marking tracks or nest area if they are unable to stay on site until official crew arrives, large trucks traversing the beach are to be escorted by trained, approved monitors, preferably on an ATV, during the sea turtle nesting season.
 - b. Enforcement of speed limits.
 - c. During the turtle nesting season a backhoe, or tractor will be available on site to smooth and level ruts as necessary. A turtle monitor should supervise this activity.
 - d. During peak Kemp's ridley nesting season (May, June, July) large vehicles will not drive the beach before a turtle monitor patrols the beach ahead of them and clears them for vehicles to travel down the beach.
 - e. When and if appropriate crews will utilize a shuttle service provided by an escort vehicle to limit beach traffic.
 - f. No night beach trips for larger vehicles during the sea turtle nesting season to minimize impacts to and protect the green and loggerhead sea turtles which are nocturnal nesters.
2. If the construction phase, including inlet dredging and the disposal of dredged sediments, will be conducted during the sea turtle nesting season (March 15 through September 15), surveys for nesting turtles shall be conducted daily, prior to construction activities each morning until the project is complete or sea turtle nesting season has ended.
 3. Future maintenance disposal (beach nourishment will not be conducted during the sea turtle nesting period (March 15 - September 15).
 4. A methodology should be coordinated with the Service or Donna Shaver, USGS Sea Turtle Coordinator, Padre Island National Seashore to notify her or her staff to investigate turtle sightings, nesting and relocation of eggs.
 5. Sea turtle nesting surveys shall only be conducted by personnel with training in nest survey procedures. Surveyors shall be authorized under a valid U.S. Fish and Wildlife

Section 10 (a) permit. Nest surveys shall be conducted daily between sunrise and start of construction activities. Surveys shall be performed in such a manner so as to ensure that construction and maintenance activities do not occur in any location prior to completion of the necessary sea turtle protection measures.

6. From March 15 through September 15, staging areas for construction equipment will be coordinated with the Service prior to construction activities to avoid and minimize impacts to sea turtles.
 - a. All equipment and/or construction pipes will be off the beach or located as far landward as possible without compromising the integrity of the existing dune system during the day and night to the maximum extent practicable.
 - b. Placement of pipes perpendicular to the shoreline is recommended as the method of storage.
7. Lighting will be limited to the immediate area of active construction only and will be the minimal lighting necessary to comply with safety requirements.
 - a. Shielded low pressure sodium vapor lights are recommended to minimize illumination of the nesting beach, jetties, and nearshore waters.
 - b. Lighting on offshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to avoid excessive illumination of the water, while meeting all U.S. Coast Guard and Occupational Safety and Health Administration requirements.
8. Upon locating a dead, injured, or a sick sea turtle specimen, the person(s) responsible for monitoring sea turtles shall develop specific procedures for notifying the Service Corps Christi Ecological Services Office (361/994-9005) or Donna Shaver, the USGS Sea Turtle Coordinator (361/949-8173, ext 226), in the event that construction activities result in the direct take (killing, harming, or maiming) a sea turtle or excavated eggs of an undetected nest. A standard methodology for handling dead or stranded sea turtles found during the monitoring program will also be established. This methodology shall be directed at determining the cause of death and ensuring that all data is recorded. The finder has the responsibility to ensure that evidence intrinsic to the specimen is not disturbed.

Piping Plovers

Monitoring for piping plovers is important to compare plover use of habitats with varying degrees of manipulation and observe trends in how this species responds to the resulting impacts of the proposed project. Monitoring for piping plovers may be limited to those areas that match

established criteria necessary for the survival of piping plovers (e.g., accreting areas at inlets; bayside, sand, and mud flats; or, recently disturbed areas such as washover areas), but should include critical habitat unit TX-6 and TX-7 including their corresponding inlets and bayside flats.

1. If construction is to commence between August 1 - May 1, the COE will survey for piping plovers immediately prior to the start of construction operations. If the construction phase, including inlet dredging and the disposal of dredged sediments, will be conducted during the piping plover wintering season, August 1 through May 1, the Service, at its discretion may initiate surveys for foraging and roosting plovers.
2. If future maintenance disposal (beach nourishment) is to be conducted during the piping plover wintering season (August 1 - May 1) surveys for wintering piping plovers will be coordinated with the Service prior to placement.
3. Piping plovers exhibit diurnal shifts in habitat use; therefore, observations should be conducted for the minimum amount of daylight hours, including 30 minutes after sunrise to 30 minutes before sunset, and should be evenly distributed throughout this period, including a wide range of tidal conditions and habitat types. The amount of time necessary to survey each site will depend on the amount and type of habitat to be covered; areas should be surveyed slowly and thoroughly.
4. Whenever possible, data collection should include: 1) dates when monitoring began and ended; 2) the date, time, and location of each observation; 3) the number of birds seen; 4) the microhabitat of the occurrence (e.g. sand and mudflats, beach, etc.); 5) the activity of the birds (e.g. foraging, roosting); 6) any visible markings or identifying features (i.e., leg bands); 7) locations of foraging territories; and, 8) indices of predator abundance.
5. Monitoring should not be conducted during poor weather (winds > 25 mph, heavy rain, severe cold) since birds may seek protected areas during these times.
6. The person(s) responsible for monitoring piping plover presence shall develop specific procedures for notifying the Service's Corpus Christi Ecological Services Field Office (361/994-9005) in the event that construction activities result in the direct take (killing, harming, or maiming) of a piping plover. The Service, the City, and the COE shall develop a standard methodology for handling dead piping plovers found during the monitoring program. This methodology shall be directed at determining the cause of death and ensuring that all banding data are recorded.
7. To reduce impacts of piping plover habitat and critical habitat in TX-7 and to maximize overwash areas preferred by piping plovers for roosting in the vicinity of the channel, sediments will not be placed within 1000 ft from Newport Pass. No staging of equipment or materials will be conducted at or near Newport Pass.

Annual Reports

1. The COE and/or the City will submit an annual accomplishment report of the reasonable and prudent measures and terms and conditions outlined in this BO. The first report should be submitted one year following initiation of project construction.
2. Reports should be sent to: U.S. Fish and Wildlife Service, Corpus Christi Ecological Services Field Office, ATTN: Field Supervisor, c/o TAMU-CC, 6300 Ocean Drive, Campus Box 338, Corpus Christi, Texas 78412

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal action agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or develop information.

For the benefit of sea turtles (Kemp's, loggerheads and green), the Service recommends the following conservation recommendations:

1. Educational signs should be located at beach access points and/or jetties explaining the importance of the area to sea turtles and/or the life history of sea turtle species that nest in the area at other appropriate City locations.
2. The COE, in cooperation with the Service, County and the City, should implement and enforce a lighting ordinance, management plan, and/or condition to eliminate or reduce the amount of artificial lighting affecting nesting sea turtles and/or hatchlings.
3. The COE, in cooperation with the City and local sponsors of all sediment disposal projects, should design and fund a research program to determine the long-term effects of beach disposal on sea turtle nesting success. This program would collect and analyze data on the physical, biological, and chemical characteristics of disposal and natural beaches and the data examined with regard to sea turtle reproductive success. The goal of the effort would be to develop methods for minimizing the adverse impacts of sediment disposal activities on sea turtle reproduction.

For the benefit of the piping plover, the Service recommends the following conservation recommendations:

1. The COE should endeavor to create and maintain suitable piping plover, migrating, and overwintering habitat. Natural accretion at inlets should be allowed to remain. Accreting sand spits on barrier islands provide excellent foraging habitat for migrating, and

overwintering plovers.

2. The COE should fund monitoring surveys for migrating, and wintering piping plovers on and around all beaches and inlets outside the action area of this project that currently receive, or are scheduled to receive, a Federally-maintained sediment disposal or inlet dredging project. This data would assist the and the Service in determining the long-term impacts these routine activities have on this species and their seasonal use of these sites, and would be important in developing protective and operational measures to assist in recovery of the species. The goal of the effort would be to develop methods for minimizing the adverse impacts of sediment disposal and inlet dredging on piping plovers. A detailed report documenting the number and location of birds found and the behavior they were engaged in should be submitted to the Service annually following the wintering/migrating season.
3. A conservation/education fact sheet or display sign would be helpful in educating local beach users about the coastal beach ecosystem and associated rare species. The fact sheet/sign could highlight the piping plovers life history and basic biology and ways recreationists can assist in species protection efforts (e.g., keeping pets on a leash, removing trash to sealed refuse containers, etc.). The Service would be willing to assist in the development of such a fact sheet/sign, in cooperation with the City of Corpus Christi and the , interested non-governmental stakeholders (i.e., National Audubon Society), the , and the other interested stakeholders (County, property owners, etc.).

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation and conference on the action outlined in your request for formal consultation for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (Packery Channel). As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; (4) a new species is listed or critical habitat designated that may be affected by the action; (5) this opinion does not authorize take of piping plover habitat within the MBCHC critical habitat unit (TX-6).

If you or your staff have any questions concerning this opinion, please contact Allan Strand or Mary Orms at (361) 994-9005 or via email at allan_strand@fws.gov or mary_orms@fws.gov.

Sincerely yours,

A handwritten signature in cursive script, reading "Allan M. Strand". The signature is written in dark ink and is positioned above the printed name and title.

Allan Strand
Field Supervisor

cc: Carolyn Murphy, COE, Galveston, TX
Renne Lohofener, FWS, Austin, TX
Susan MacMullin, FWS, Albuquerque, NM

Table 1. Description of Placement Areas (PAs)

PA #	Location	Size (acres)	Capacity	Material	Further Description
1	On south side of channel	14.0 acres	131,900 cy	<p>New work material from stations 12+00 through 71+00 and sands between Stations 71+100 through 136+50 will be deposited into PA 1.</p> <p>The initial discharge into PA 1 will include fine-grained material from the western end of Reach 2.</p> <p>The second stage of filling into PA 1 will use sandy material found further east along the channel.</p>	<ol style="list-style-type: none"> 1) PA is separated by the floodgate and channel access to Lake Padre. Existing floodwall on south side will serve as the southern retaining structure for PA 1 and PA 3. 2) The PA must first be excavated (approximately 50,800 cy of sand) to a depth of 0.0 foot MLLW to create the capacity required for the new work material. 3) The sandy material excavated from PA 1 will be placed in PAs 2, 3, or 4S or used to construct PA 1 levees. 4) A temporary levee will be constructed along the north, west and east side of PA 1 to an elevation of 8.25 feet MLLW. The levees will be constructed with sand excavated from within PA 1. 5) A weir will be constructed on western end of PA to allow for discharges through a drainpipe and temporary drainage ditch to Inner Basin. 6) The discharge effluent shall be controlled to achieve acceptable levels of total suspended solids (TSS) and samples will be taken daily when effluent is most turbid. 7) To allow settling of the fine-grained material a small impoundment will be constructed in the PA by blocking the weir. 8) Once sufficient settling and clear surface water has formed the weir blockage can be removed and water allowed to discharge. 9) The need for ponding to allow settling and water clarification will not be necessary with sandy material as it is for fine-grained material. 10) Once a sufficient volume of fill is in place, the site will be graded and any necessary erosion control will be installed. 11) Due to the fine-grained material in this location, there will likely be subsidence. 12) Temporary levees will be regarded to a crest elevation of 5.25 feet MLLW. 13) The regraded slope on the north and west sides will be armored with CCM.
2	North side of the channel across from PA 1 and PA 3.	13.7 acres	59,300 cy	<p>PA 2 will be constructed of material mechanically excavated from the channel between station 165+50 to 174+64 or from within PA 1.</p> <p>The new work material placed in PA 2 will be predominantly sand</p>	<ol style="list-style-type: none"> 1) The material will be placed and compacted into PA 2. 2) The elevation along the west and south side will be 5.25 feet MLLW with the north side at approximately 6.65 feet MLLW. 3) The perimeter slopes will be graded to 3H:1V slopes and armored with CCM.
3	South side of channel	4.3 acres	26,200 cy	<p>Material mechanically excavated from between station 136+50 to 140+53 or PA 1 will be placed into PA 3.</p> <p>The fill will be predominantly sand and will be placed and compacted into PA 3.</p>	<ol style="list-style-type: none"> 1) The elevation of the fill along the west and north side of the PA will be 5.25 feet MLLW. 2) The south side fill along the floodwall will be to elevation 6.0 feet MLLW. 3) The perimeter slope of PA 3 will be graded to 3H:1V slopes and armored with CCM.

4S	On the beach south of the jetties	73.2 acres	<p>volume proposed for placement is 744,430 cy</p> <p>New material consisting primarily of sand for beach renourishment.</p> <p>Placement of the new work material will be discharged onto the beach on the northern end and proceed to the south.</p> <p>Based on modeling URS (2002) modeling results it is estimated that material placed at PA 4S will remain in place providing storm protection for about 3 years.</p> <p>It is estimated that annual channel maintenance and sand bypass will provide over 200,000 cy of sand each year for beach replenishment, that can be placed in either PA 4S or PA 4N as needed.</p>	<ol style="list-style-type: none"> 1) PA 4S will provide Beach renourishment storm damage protection for the life of the project. 2) While only PA 4S will be used for new work material placement, Pas 4S and 4N can be used for maintenance material placement based on need as determined by beach erosion. 3) All material in Reach 1 is suitable for beach placement because of its high sand content. 4) Sediment from portions of Reach 2 are also appropriate for beach placement which are suitable for beach placement because of its high sand content. 5) The new work material for beach placement will be placed south of the jetties and extend seaward from the seawall, which runs parallel to the beach in front of resort development. 6) This seawall is distinct from, and should not be confused with, the floodwall that runs parallel to the extension of Packery Channel from roughly Station 148+00 to Station 173+00. 7) Where actual placement will occur will be located from approximately 500 feet south of the south jetty to 2,000 feet south of the southern end of the seawall, a distance of approximately 7,200 feet. 8) Sand placement will entail constructing an approximately 450-foot-wide berm east from the parallel to the seawall, with a top elevation of 3.0 feet MLLW (approximately 2 feet above the existing beach elevation). 9) Fill will flow by gravity and extend seaward from the berm with a slope estimated to be 20 feet horizontally to 1 foot vertically and terminate at the third offshore sand bar, a distance of approximately 300 feet from seaward edge of the berm. 10) Over time the fill will be processed by the wave action, and will reach an equilibrium that is significantly narrower than the 300-foot initial width. 11) The transition zones from the berm to the existing beach level on the north and south ends of the placement area will extend approximately 500 feet in each direction. 12) If necessary, small retaining dikes will be constructed along the landward edge and along the seaward edge of the Project area to contain the discharge as it is placed on the beach. The retaining dikes will advance along the beach as the fill is placed. 13) Without replacement the beach placement will erode and the beach slope will flatten to its original condition over 3 years.
4N	On the beach north of the jetties	19 acres	<p>not provided</p> <p>Channel maintenance material will be placed in PA 4N.</p> <p>Placement of the sandy material will be deposited in a similar design as that described for PA 4S, but with a berm width of approximately 70 feet and an elevation of 3 feet MLLW.</p>	<ol style="list-style-type: none"> 1) Sand from maintenance and sand bypass will be available annually if needed to maintain this beach.

MMPA	On property north of the channel near Station 50+00	10.5 acres	150,000 cy	<p>Material not appropriate for beach placement will be placed in this confined upland disposal area.</p> <p>This site will accommodate anticipated maintenance dredging of 15,000 cy of material every 5 years for the 50-year project life, for a total capacity of 150,000 cy.</p>	<ol style="list-style-type: none"> 1) Property is known as the "emergent island east of GIWW PA 174". 2) It is under easment to the Port of Harlingen Authority and the non-Federal Sponsor (City) is using it under a 50-year permit from the Port of Harlingen Authority. 3) Two locations at the MMPA will be used. 4) Narrow barge lanes (each approximately 30 feet wide) will lead from Packery Channel. 5) To accommodate the maintenance material, perimeter dikes will be built with a top elevation of 20 feet from the ground elevation.
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Table 2. Anticipated Packery Channel Park/Utility Related Improvements Location & Description

Proposed Improvements	Location and Description
Beach Access Parking	Public parking behind seawall for 300 cars.
South Side Beach Park	Improved parking lot for 300 cars Pedestrian trails linking parking with the channel and jetty and along the channel Elevated bath house with restrooms Shade pavilions Vendor kiosk areas.
North Side Beach Park	Improved parking lot for 200 cars Improved park access road from Zahn Road Pedestrian trails linking the park with the channel and jetty Pavilion including restrooms, showers, and concessions Recreational courts and protected kids play area Vendor kiosk areas.
Channel Utility Crossings	Multiple casings for underground utility crossings.
North Side Wetlands Area	Pedestrian trails linking the channel to observation areas Observation areas/overlooks.
North Side Channel Park	Four boat ramps and support facilities Parking to support boat ramps with space for 300 vehicles/trailers Improved RV sites for up to 150 Rvs Maintenance/administration building and facilities to support beach cleaning and channel maintenance Improved access road from Zahn Road.
Packery Point Park	Four public boat ramps and support facilities Parking to support boat ramps with space for 300 vehicles/trailers Shade structures Public restrooms.
Causeway Area Access Point	Renovated existing boat ramps Two additional boat ramps and support facilities Improve existing parking and add space for 100 vehicles/trailers.

Table 3. Piping plover surveys within action area

Survey	Piping Plover Number
International Shorebird Survey July 1996-September 2000 A total of 50 days of survey	Newport Pass--984 birds, Max. daily sighting 210 birds Packery Channel--206 birds, Max. daily sighting 27 birds Beach/Packery--337 birds, Max. daily sighting 54 birds
1991 Piping Plover Census Single day of survey	43 birds in Packery Project Area
1996 Piping Plover Census Single day of survey	1 bird from Corpus Christi Pass to Fish Pass Passage of a strong cold front
2001 Piping Plover Census Single day of survey	123 birds Upper Laguna Madre-Vicinity of Packery Channel
2002. Newport Pass. Assessment of Shorebird Use on Maintained and Un-maintained micro-habitat. Landgraf & Kolar 2002. (8 survey days)	North of Newport Pass-- 82 South of Newport Pass--107 Newport Pass--19 birds

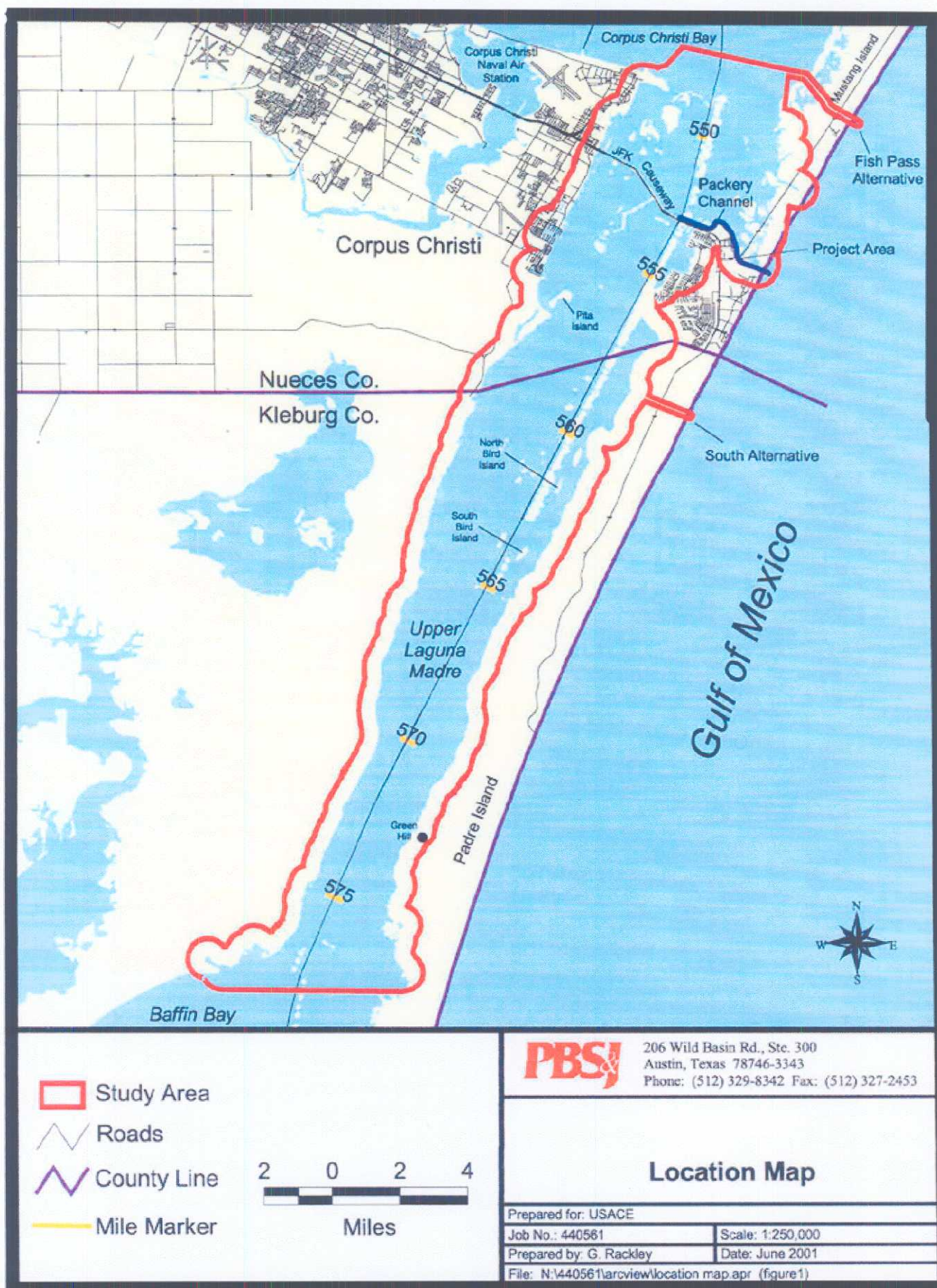


Figure 1



Action Area

Figure 2



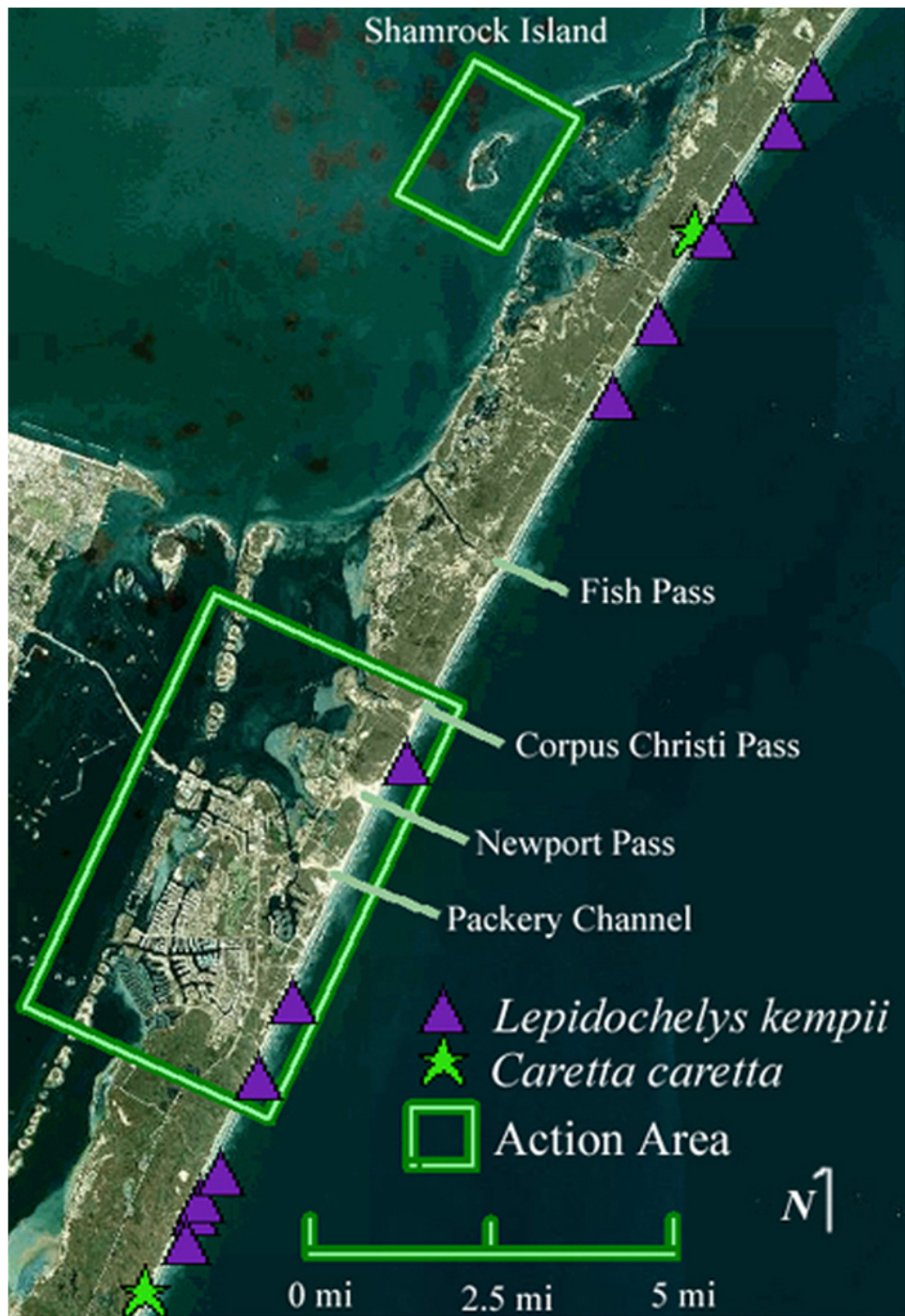
Figure 3



Figure 4



Figure 5



Sea Turtles within Action Area

Figure 6

TIME SERIES OF SIMULATED TIDE ELEVATIONS USING REAL TIDE AND WIND DATA
WITH AND WITHOUT PACKERY CHANNEL (CONTINUED)

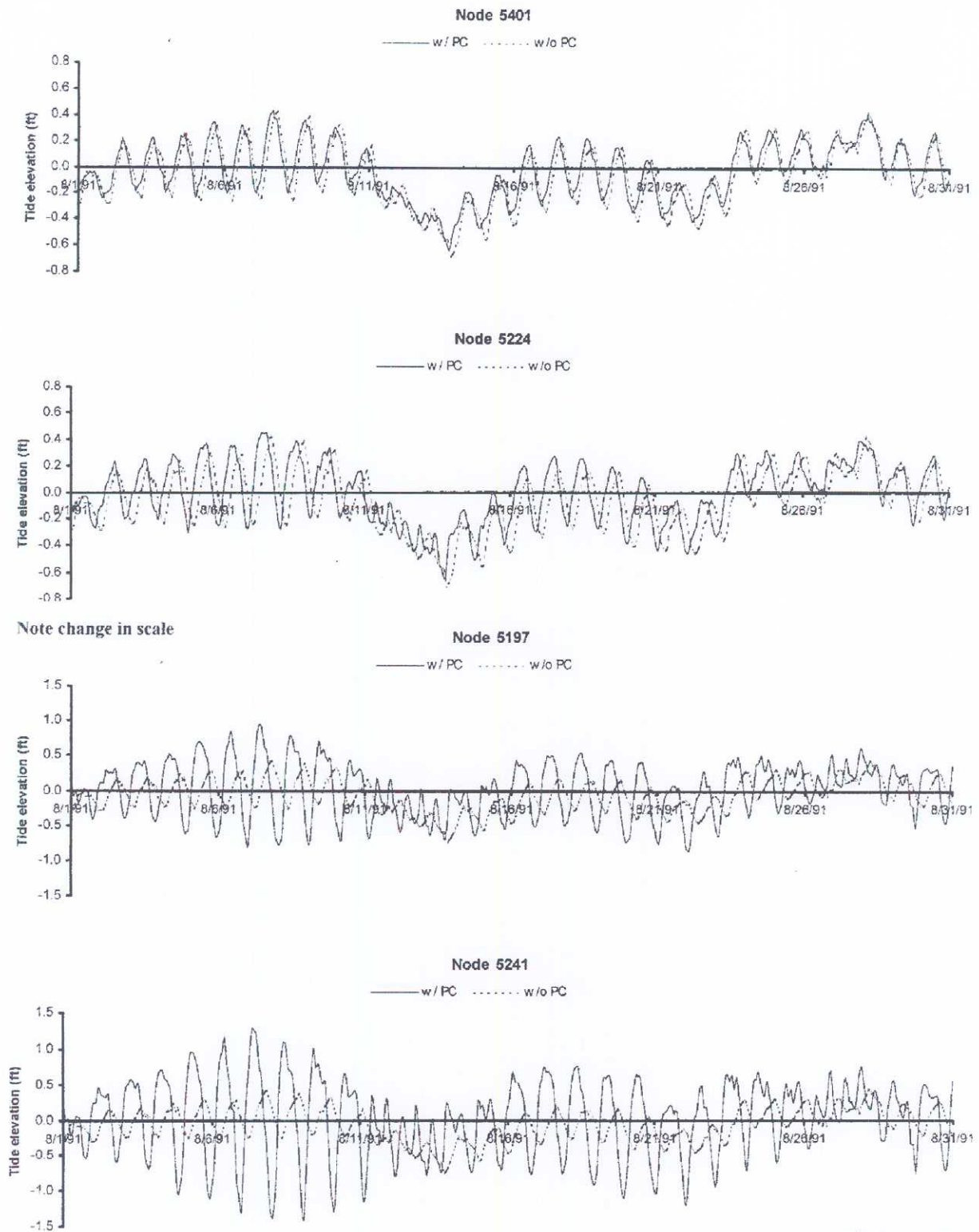
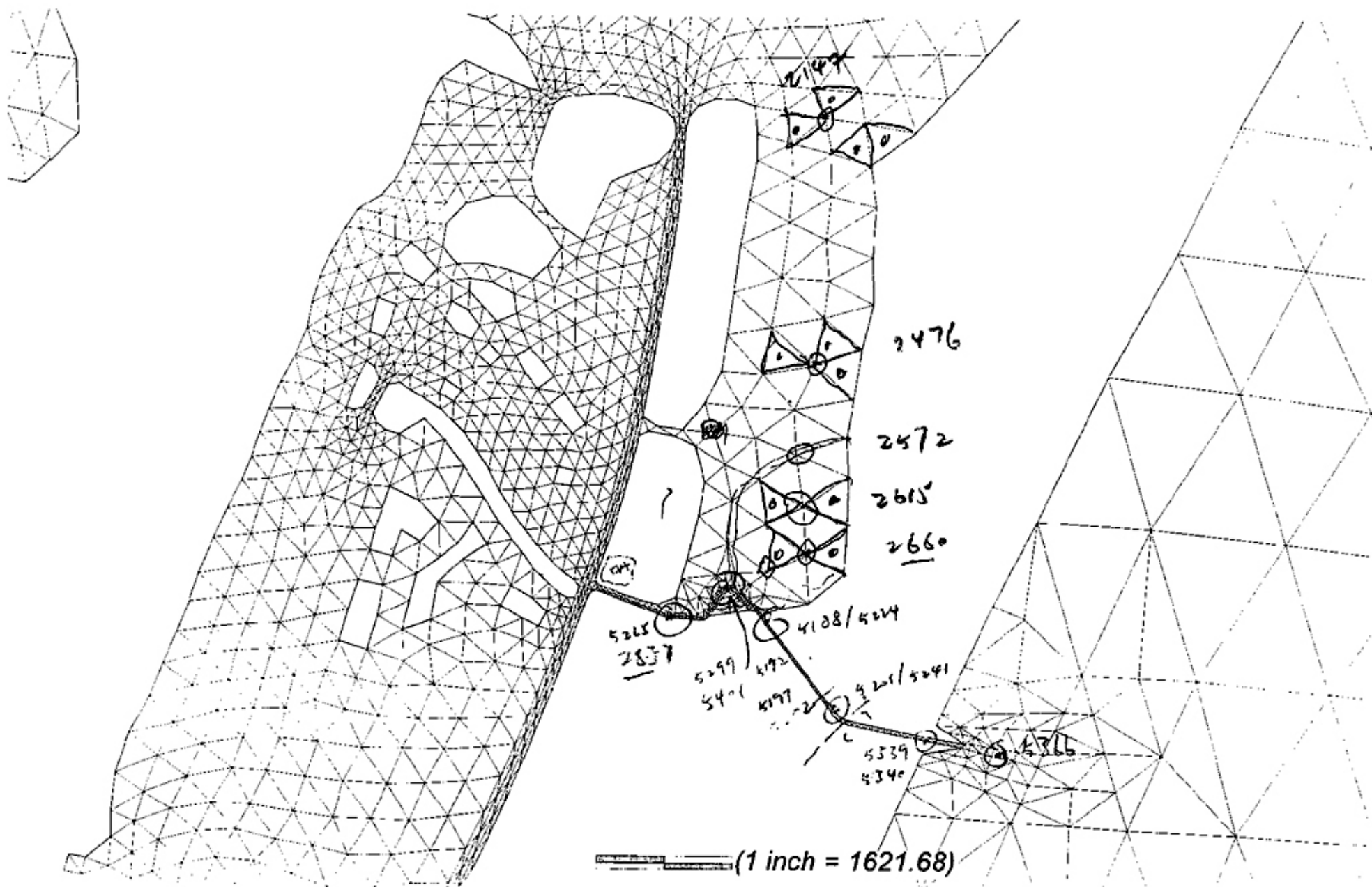
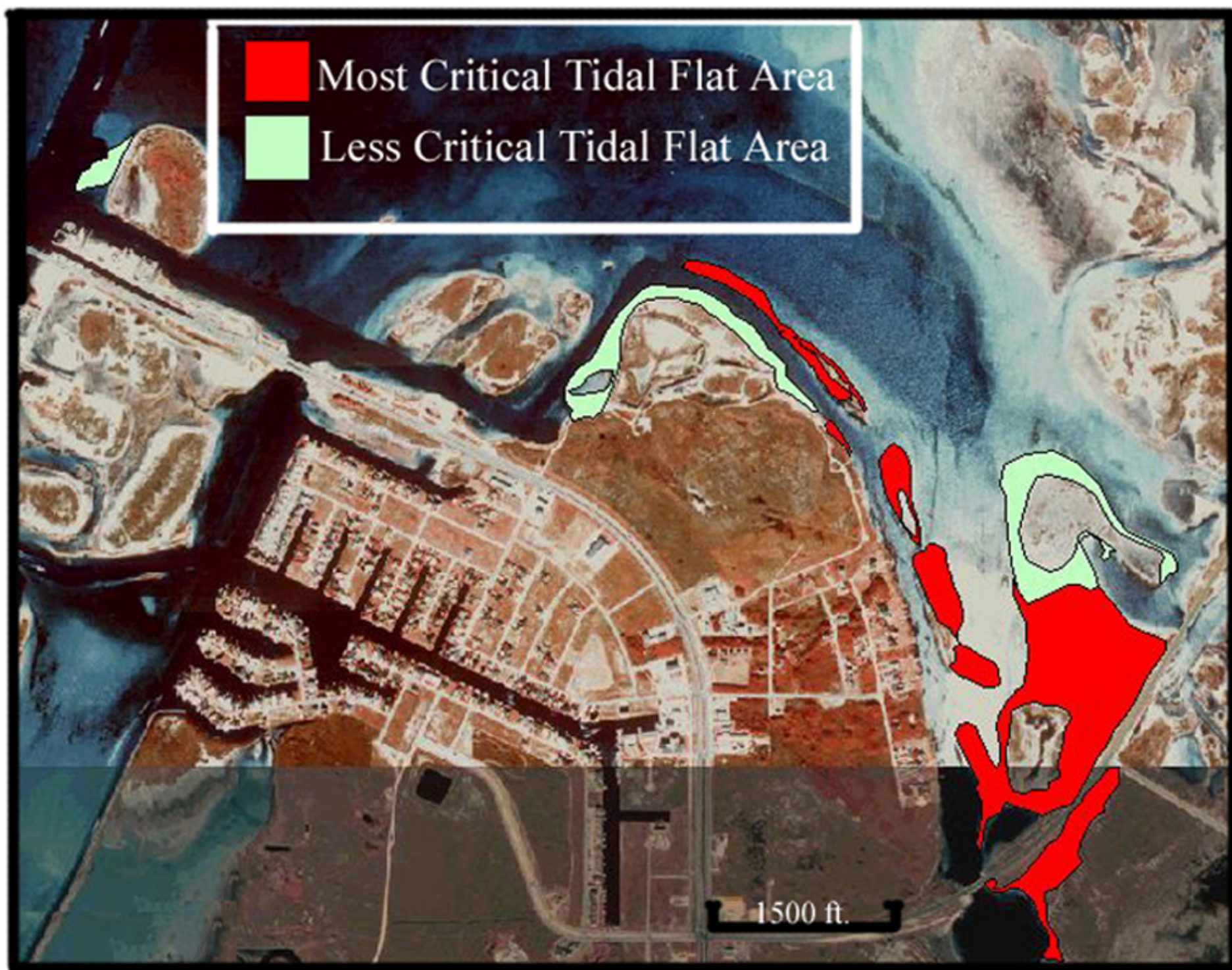


Figure 7



Packery Channel Model

Figure 8



MBCHC Tidal Flats

Figure 9

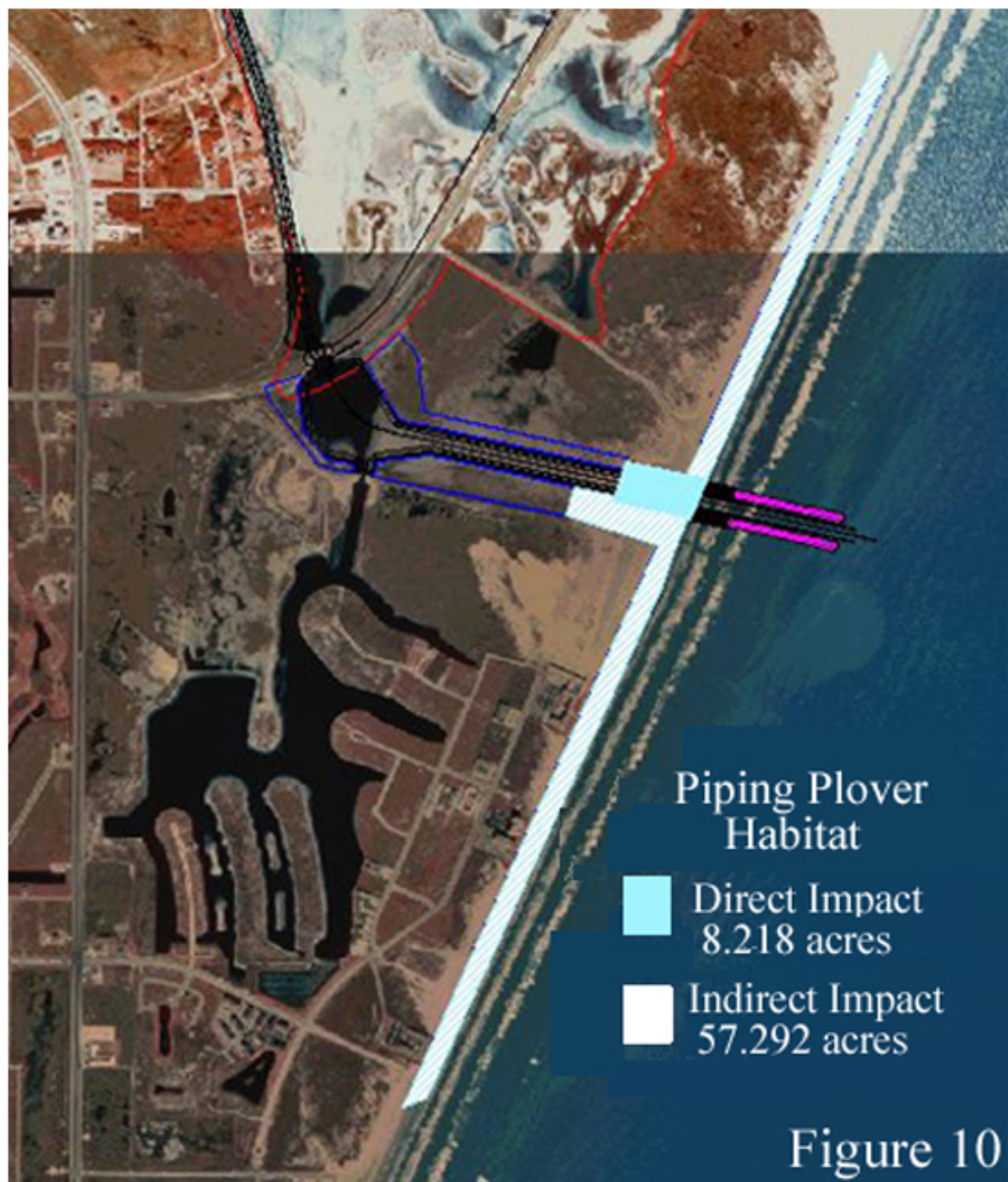
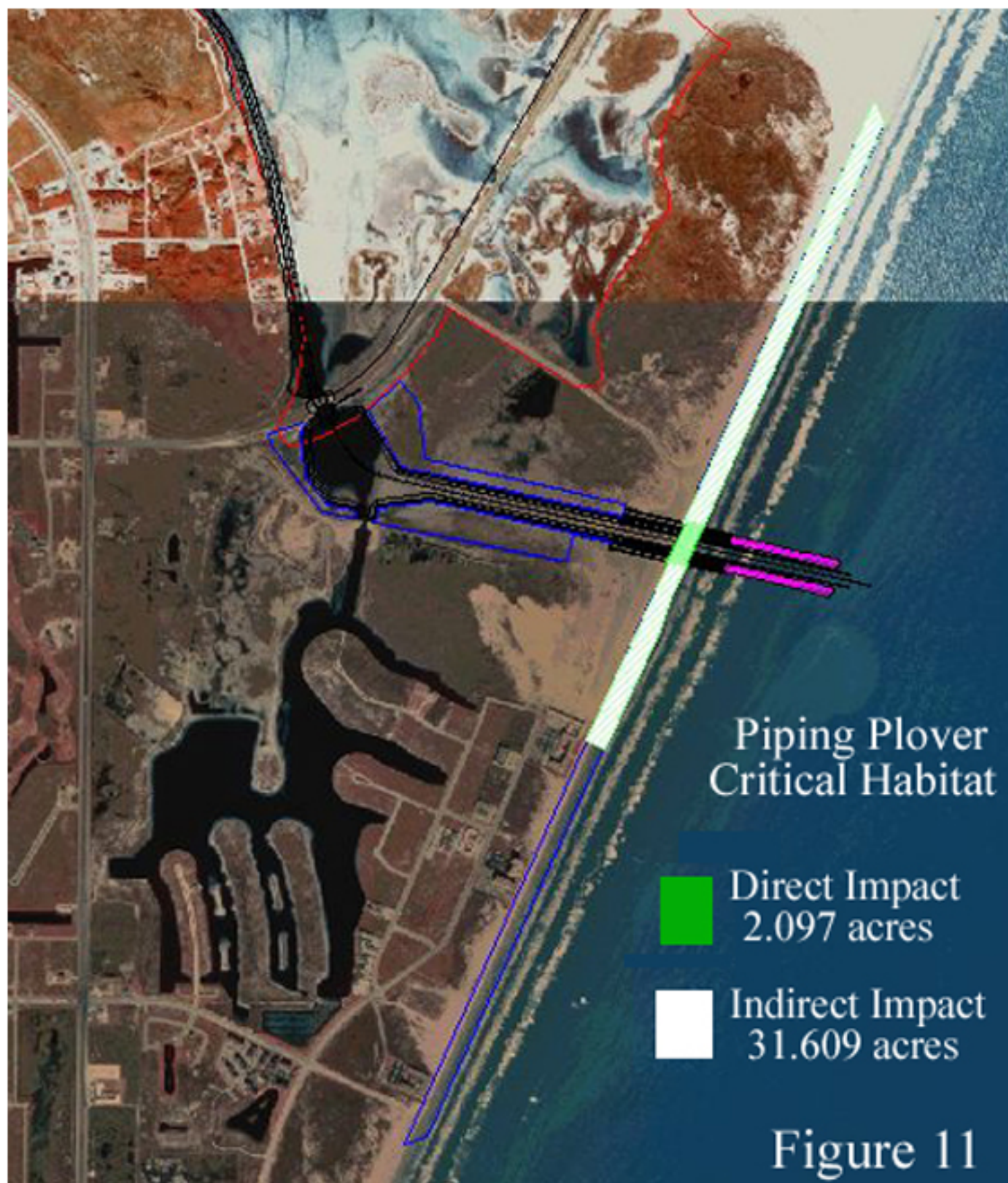


Figure 10



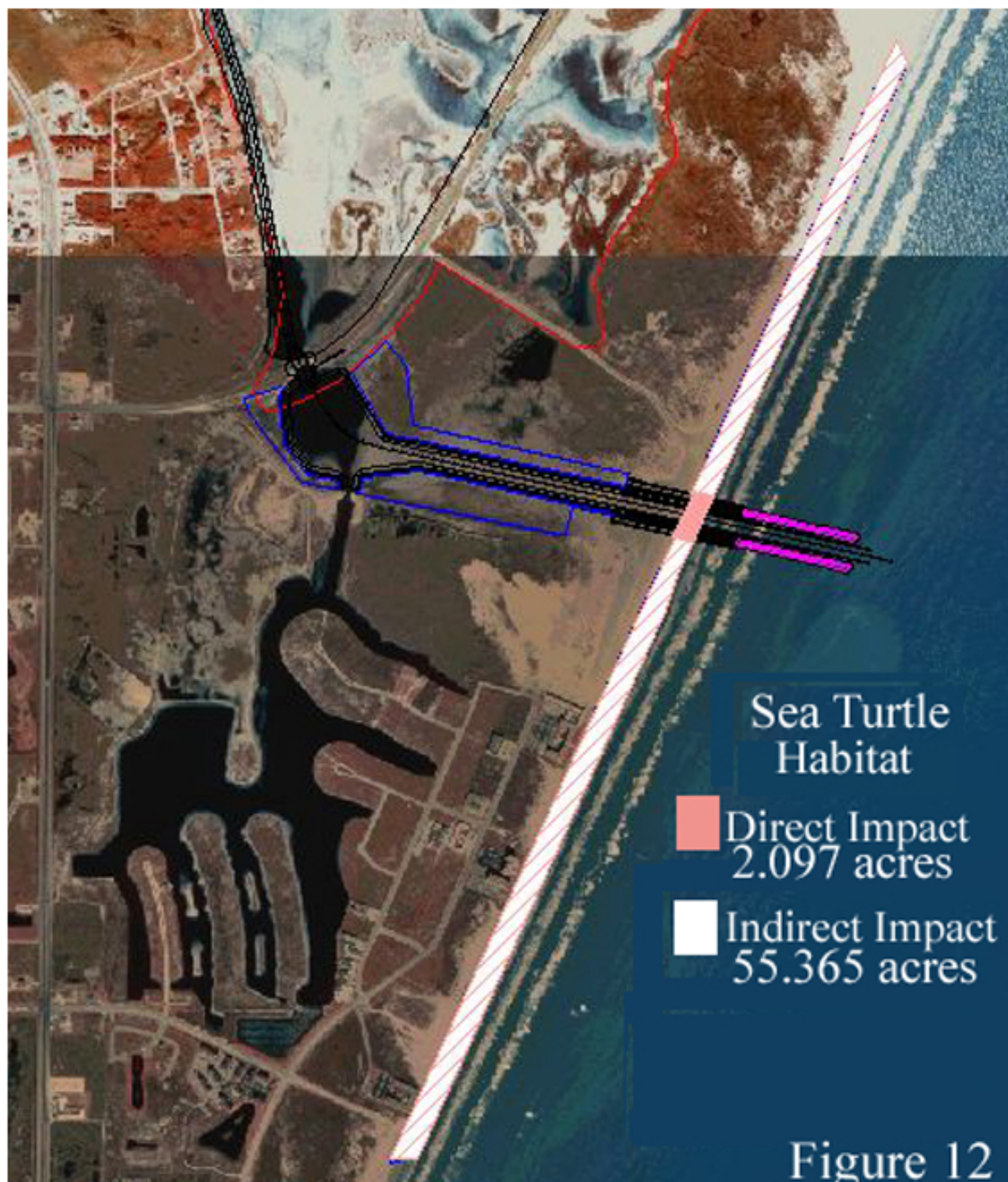


Figure 12

APPENDIX G

COORDINATION

APPENDIX G-1

**NOTICE OF PUBLIC SCOPING MEETING (SEPTEMBER 7, 2000)
AND PUBLIC HEARING (JULY 18, 2002); ANNOUNCEMENT
OF PROJECT IN FEDERAL REGISTER, AND
PROJECT DESCRIPTION WEB PAGE**



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

August 17, 2000

REPLY TO
ATTENTION OF:

Environmental Branch

Notice of Studies and Initial Public Scoping Meeting for Packery Channel-North Padre Island Storm Damage Reduction and Environmental Restoration Project Corpus Christi, Texas

Introduction

This notice provides a summary of the ongoing study activities for the Packery Channel-North Padre Island Storm Damage Reduction and Environmental Restoration Project, Corpus Christi, Texas and solicits public input regarding the study. The local sponsor for this project is the City of Corpus Christi.

Study Background

The project is located along the south-central Texas coast on the southern portion of Mustang Island. The project will provide storm damage reduction and environmental restoration by creating an opening between the Gulf of Mexico and Corpus Christi Bay, and placing excavated material in front of the Padre Island Seawall. The project channel will extend from the Gulf of Mexico through a jettied entrance and a channel through Mustang Island, east and adjacent to John F. Kennedy Causeway, therein to the existing Packery Channel, joining the main channel of the Gulf Intracoastal Waterway in the vicinity of mile 553.

Packery Channel has historically been an intermittent tidal inlet, but with continuing modifications to Aransas Pass associated with the Corpus Christi Ship Channel, Packery Channel has remained closed over at least the last 50 years. Local interests have indicated that the channel would also result in positive environmental benefits to the Upper Laguna Madre by increasing water circulation.

The Water Resources Development Act of 1999, Section 556, provides contingent authorization to construct the North Padre Island Storm Damage Reduction and Environmental Restoration Project, Texas, if the Secretary determines that the locally preferred plan (LPP) is technically sound and environmentally acceptable.

Study Process

The study involves conduct of sufficient engineering analysis and investigations to determine if the project design meets Corps' criteria and standards. Environmental baseline data are being assembled in order to address the

environmental acceptability of the LPP. The environmental acceptability statement will address the status of current environmental documentation and coordination of the project, identified and potential impacts, environmental benefits, and will identify appropriate National Environmental Policy Act compliance requirements for the project.

Study Status

The District is proceeding with studies to determine the technical soundness and environmental acceptability of the LPP at full Federal expense. The studies will result in a Project Report.

Public Participation

The Galveston District will hold the initial Public Meeting for the project on September 7, 2000. The purpose of the meeting will be to inform the community about the project and current studies. This notice serves as an invitation to the public to attend. The public will be provided an opportunity for comments.

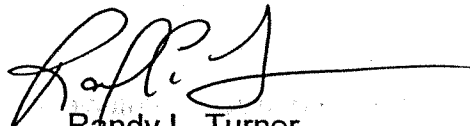
Location: Bayfront Convention Center
Room 220
1901 N. Shoreline Blvd
Corpus Christi, Texas

Time: 7:00pm – 9:00pm (Thursday, September 7, 2000)
Registration to begin at 6:00pm

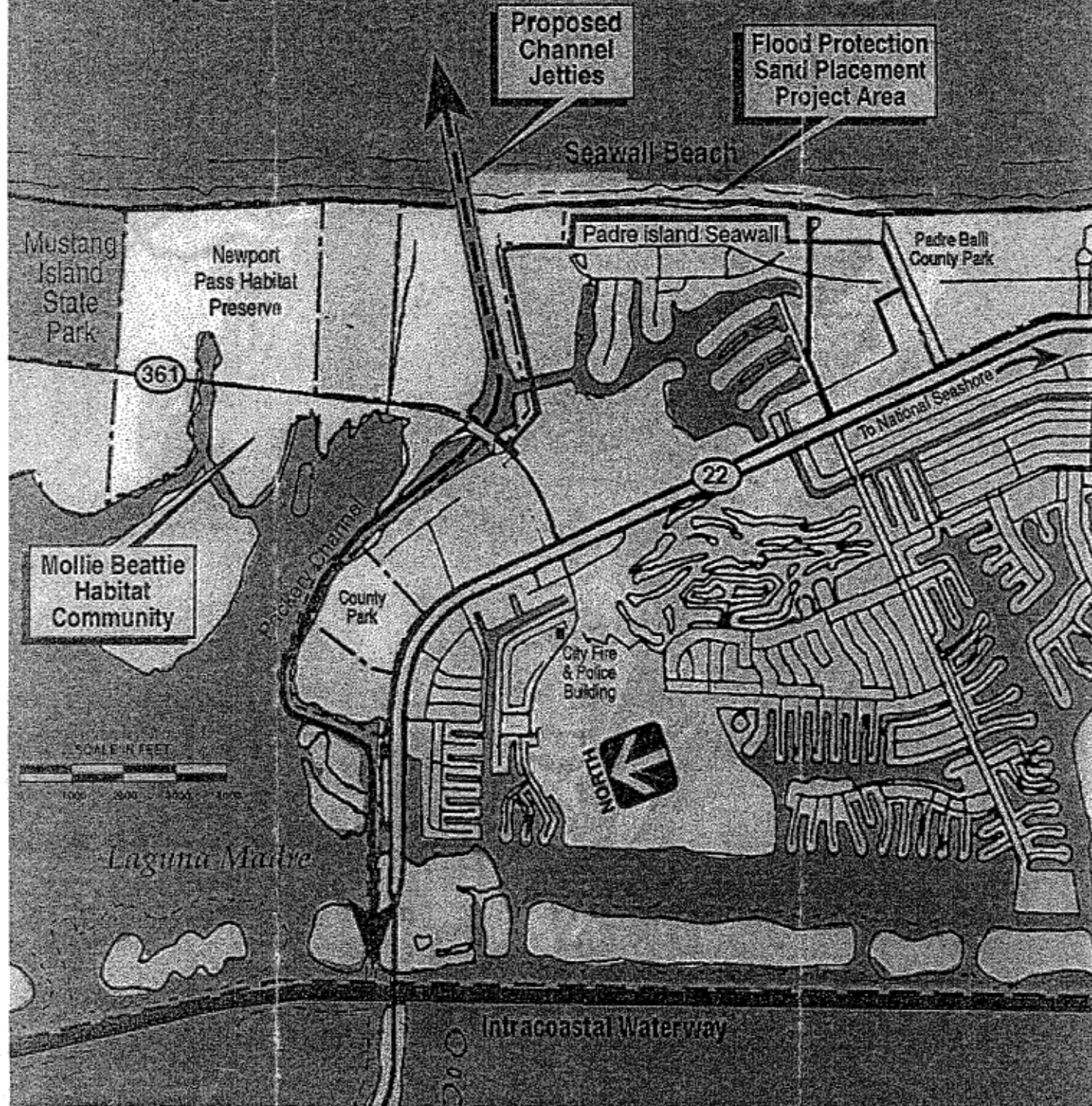
We are especially soliciting comments/concerns on environmental issues including:

Resources of particular concern;
Opportunities for the beneficial uses of dredged material; and
Development of a long-term disposal plan.

All interested parties are invited to provide input to this study so that all concerns may be addressed. If you wish to submit written comments or mailing list updates please send them to the address shown on the first page of this notice. Your input is requested by September 29, 2000. If we can provide further information, contact the Project Manager, Mr. Carl Anderson, by phone at (409) 766-3914, or by email at Carl.M.Anderson@swg02.usace.army.mil.


Randy L. Turner
Major, Corps of Engineers
Acting District Engineer

NORTH PADRE ISLAND PROJECT





GALVESTON DISTRICT



NORTH PADRE ISLAND STORM DAMAGE REDUCTION AND ENVIRONMENTAL RESTORATION PROJECT NUECES COUNTY, TEXAS

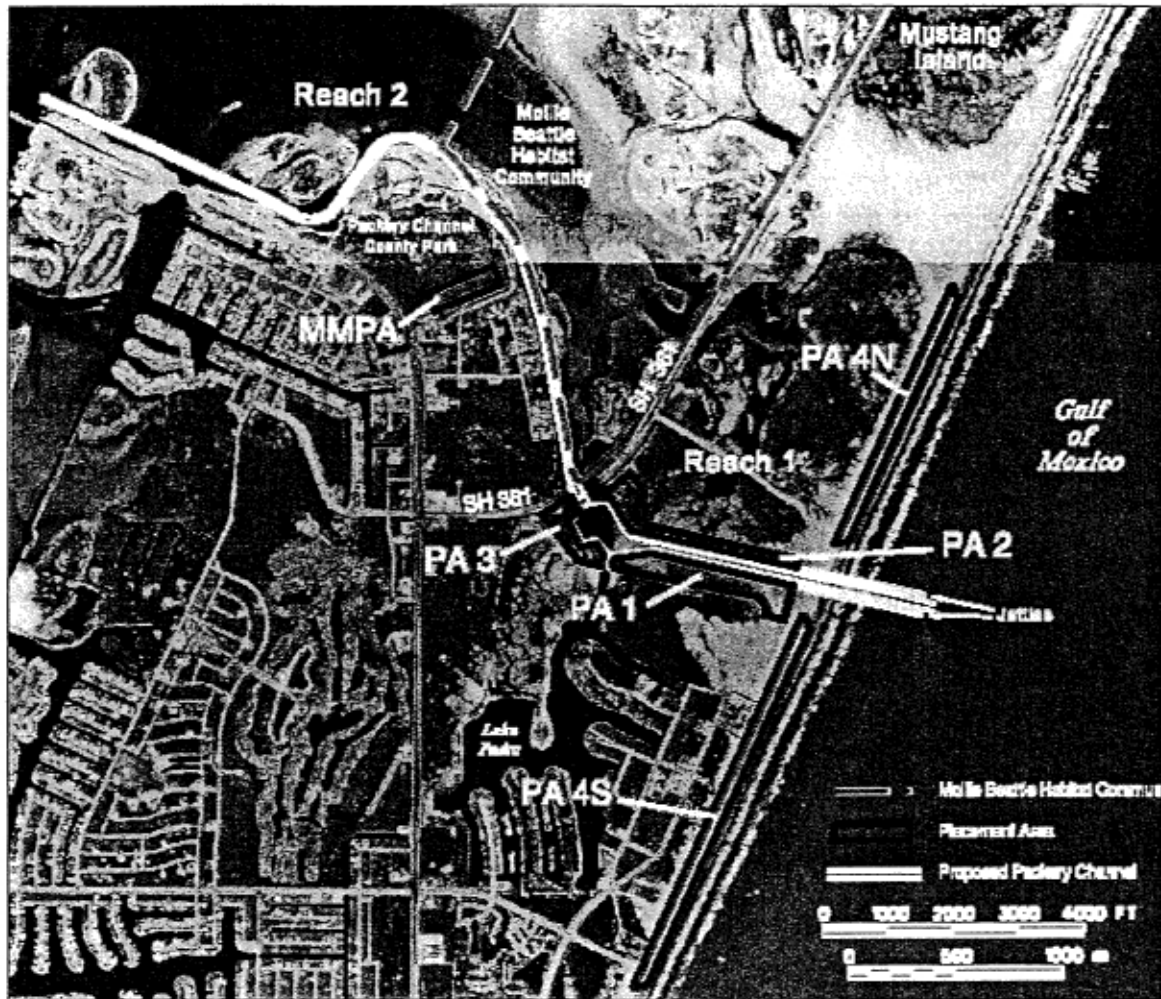
PUBLIC HEARING July 18, 2002

Project: The Secretary of the Army was directed by Congress to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island (Project). The Project is described in the Draft Environmental Impact Statement (DEIS), as are the benefits and impacts to be expected from the Project. Erosion of the beach in front of the seawall just south of the boundary between Mustang and North Padre Islands is causing a loss of recreational beach. Dredging Packery Channel would provide sand for nourishment of the beach and an enlarged beach would reduce potential future storm damage. A Project Study Plan, prepared by the Corps in 1999, examined three alternative sites including Packery Channel. Three different channel widths under three different salinity regimes were also examined to determine the environmental benefits of an opening between the Laguna Madre and the Gulf of Mexico.

The selected project consists of dredging a 14-foot-deep by 116-foot-wide channel to connect the existing Packery Channel to the Gulf of Mexico and dredging the existing channel to a depth of -7 feet (mean sea level) and a width of 80 feet connecting to the Gulf Intracoastal Waterway (GIWW). The total length of the proposed channel from the Gulf end of the jetties to the GIWW is approximately 18,500 feet (3.5 miles). Approximately 753,800 cubic yards (cy) of material will be dredged during construction, most of which (544,800 cy) will be placed on the beach south of the proposed jetties. Sandy maintenance material from the channel east of the SH 361 bridge will be used for beach nourishment, and a sand bypass system will be designed to move accumulated sand from longshore drift to the downdrift side of the jetties. Approximately 15,000 cy of estimated silty maintenance material dredging every 5 years will be placed in an upland site. Secondary development that includes public improvements is being proposed by the City of Corpus Christi, the local sponsor. Proposed park amenities encompass approximately 14.2 acres and include access to Packery Channel, the beach, and the jetties; passenger and recreational vehicle parking; walkways; restrooms; and vendor facilities. The location of two potential City of Corpus Christi parks are proposed along the western reach of Packery Channel.

Availability of Draft Environmental Impact Statement (DEIS): Pursuant to section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969, as amended and as implemented by the Council on Environmental Quality (40CFR

Parts 1500-1508), a DEIS for the North Padre Island Storm Damage Reduction and Environmental Restoration Project has been filed with the Environmental Protection Agency and is available to Federal, State and local agencies and all interested parties. The availability of the DEIS was announced in the Federal Register on June 14, 2002. Copies of the DEIS are available in hard copy or CD format. You may obtain them by writing the USACE Galveston District, Attn: Sam J. Watson, P.O. Box 1229, Galveston Texas 77553 or by calling (409) 766 - 3946. The document may also be seen at www.swq.usace.army.mil



Welcome to the Public Meeting on the
**NORTH PADRE ISLAND STORM DAMAGE REDUCTION
AND ENVIRONMENTAL RESTORATION PROJECT**
NUECES COUNTY, TEXAS
Sponsored by the City of Corpus Christi
and the U.S. Army Corps of Engineers

**NOTICE OF PUBLIC HEARING
FOR
NORTH PADRE ISLAND STORM DAMAGE REDUCTION
AND ENVIRONMENTAL RESTORATION PROJECT
(PACKERY CHANNEL)
NUECES COUNTY, TEXAS**

Interested parties are hereby notified of a public hearing to be conducted by the U.S. Army Corps of Engineers and the City of Corpus Christi on:

**THURSDAY, JULY 18, 2002, 7:00 P.M.
AT
THE SELENA BAYFRONT AUDITORIUM
1901 N. SHORELINE BLVD., ROOM 225
CORPUS CHRISTI, TX 78401 (361) 883-8543**

The purpose of the meeting is to inform the community about the project and the Draft Environmental Impact Statement. The meeting will also provide an opportunity for all persons to comment and provide information. Those unable to attend may send written comments to:

**U.S. ARMY ENGINEER DISTRICT, GALVESTON
ATTENTION: CESWG-PE-PR
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229**

564-7167 or <http://www.epa.gov/compliance/nea/>.

Weekly receipt of Environmental Impact Statements

Filed June 03, 2002, through June 07, 2002,

Pursuant to 40 CFR 1506.9.

EIS No. 020228, FINAL EIS, AFS, ID, Meadow Face Stewardship Pilot Project, Implementation, Nez Perce National Forest, Clearwater Ranger District, Idaho County, ID, Wait Period Ends: July 15, 2002, Contact: Darcy Pederson (208) 983-1963.

EIS No. 020229, DRAFT EIS, FHW, CA, Butte 70/149/99/191 Highway Improvement Project, Update State Route 149 to Four-Lane Expressway, From 70 North of Oroville to Route 99 South of Chico, Funding, Right-of-Way Acquisition, Endangered Species Act Section 7 and COE Section 404 Permit, Butte County, CA, Comment Period Ends: July 29, 2002, Contact: R. C. Slovensky (916) 498-5774.

EIS No. 020230, FINAL EIS, AFS, PA, Lewis Run Project, Management Strategies for Road Construction and Reconstruction, Timber Management Activities, Soil and Water Improvements, Wildlife Habitat Enhancements and Recreation Improvements, Implementation, Lewis Run Project Area, Bradford Ranger District, Allegheny National Forest, McKean County, PA, Wait Period Ends: July 15, 2002, Contact: Andrea Hille, Ext 129 (814) 362-4613.

EIS No. 020231, DRAFT EIS, COE, TX, North Padre Island Storm Damage Reduction and Environmental Restoration Project, Construction of a Channel between the Laguna Madre and the Gulf of Mexico across North Padre Island referred to as Packery Channel Project, Nueces County, IL, Comment Period Ends: July 29, 2002, Contact: Sam J. Watson (409) 766-3964.

EIS No. 020232, DRAFT EIS, FHW, WY, Wyoming Forest Highway 4 U.S. 212 (KP 39.5 to KP 69.4) the Beartooth Highway, A Portion Proposed for Reconstruction begins 7.1 miles east of the Junction of WY-296 (Chief Joseph Highway) and Proceeds East for 18.6 miles to the Wyoming/Montana State Line, Park County, WY, Comment Period Ends: July 29, 2002, Contact: Richard J. Cushing (303) 716-2138. This document is available on the Internet at: <http://www.cflhd.gov/projects/wy/beartooth/index.htm>.

EIS No. 020233, DRAFT SUPPLEMENT, FHW, WA, Cross-Base Highway Project, Updated Information, Between I-5 at the Thorne Lane Interchange and WA-7 at 176th Street

South, Major Investment Study (MIS), COE Section 404 Permit, Pierce County, WA, Comment Period Ends: July 31, 2002, Contact: Steve Saxton (360) 753-9411.

EIS No. 020234, DRAFT EIS, FTA, TX, Northwest Corridor Light Rail Transit (LRT) Line to Farmers Branch and Carrollton, Construction and Operation, NPDES and COE Section 404 Permits, Dallas Area Rapid Transit, Dallas and Denton Counties, TX, Comment Period Ends: July 30, 2002, Contact: John Sweek (817) 975-0550.

Dated: June 11, 2002.

Joseph C. Montgomery,
Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. 02-15093 Filed 6-13-02; 8:45 am]

BILLING CODE 6560-60-P

ENVIRONMENTAL PROTECTION AGENCY

[ER-FRL-6630-3]

Environmental Impact Statements and Regulations; Availability of EPA Comments

Availability of EPA comments prepared pursuant to the Environmental Review Process (ERP), under section 309 of the Clean Air Act and section 102(2)(c) of the National Environmental Policy Act as amended. Requests for copies of EPA comments can be directed to the Office of Federal Activities at (202) 564-7167.

An explanation of the ratings assigned to draft environmental impact statements (EISs) was published in FR dated April 12, 2002 (67 FR 17992).

Draft EISs

ERP No. D-BLM-L65399-OR Rating EC1, Kelsey Whisky Landscape Management Planning Area, Implementation, Associated Medford District Resource Management Plan Amendments, Josephine and Jackson Counties, OR.

Summary: EPA expressed environmental concerns that the project may adversely affect two listed species under the Endangered Species Act. EPA requested that the conclusions from the US Fish and Wildlife Service Biological Opinion be included in the final EIS and referenced in the Record of Decision.

ERP No. DS-NPS-K61121-NV Rating EC2, Great Basin National Park (GRBA) Amendment to the General Management Plan (GMP), Proposal to Construct a Visitor Learning Center on an 80-acre Parcel of Land north of the Town of Baker, White Pine County, NV.

Summary: expressed environmental concerns about a lack of pollution prevention measures in the project's construction and operation and that there was no discussion on the project's potential water quality impacts, mitigation to protect water quality, or conformity with the Clean Water Act.

Dated: June 11, 2002.

Joseph C. Montgomery,
Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. 02-15094 Filed 6-13-02; 8:45 am]

BILLING CODE 6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[FRL-7231-5]

Escambia Wood Preserving Superfund Sites; Brookhaven Wood Preserving Site—MS, Brunswick Wood Preserving Site—GA, Camilla Wood Preserving Site—GA, Pensacola Wood Preserving Site—FL; Notice of Proposed Settlement

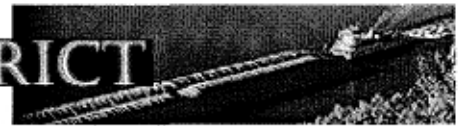
AGENCY: Environmental Protection Agency.

ACTION: Notice of proposed settlement.

SUMMARY: The Environmental Protection Agency is proposing to enter into a settlement with Mr. Charles A. Soule, Jr., pursuant to 122(h)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, regarding the Escambia Wood Preserving Superfund Sites: Brookhaven Wood Preserving Site located in Brookhaven, Lincoln County, Mississippi; Brunswick Wood Preserving Site located in Brunswick, Glynn County, Georgia; Camilla Wood Preserving Site located in Camilla, Mitchell County, Georgia; Pensacola Wood Preserving Site located in Pensacola, Escambia County, Florida. EPA will consider public comments on the proposed settlement for thirty (30) days. EPA may withdraw from or modify the proposed settlement should such comments disclose facts or considerations which indicate the proposed settlement is inappropriate, improper or inadequate. Copies of the proposed settlement are available from: Ms. Paula Batchelor, U.S. EPA Region 4 (WMD-CPSB), Sam Nunn Atlanta Federal Center, 61 Forsyth Street SW, Atlanta, Georgia 30303, (404) 562-8887. Written comments may be submitted to Ms. Batchelor within thirty (30) calendar days of the date of this publication.



GALVESTON DISTRICT

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North Padre Island (Packery Channel), Nueces County, Texas

Storm Damage Reduction and Environmental Restoration Project



Proposed Packery Channel looking toward Corpus Christi Bay.



Proposed Packery Channel looking toward the Gulf.

Introduction

The City of Corpus Christi, TX, local sponsor for the project, has expressed an interest in reopening Packery Channel. The local sponsor has developed a plan, known as the locally preferred plan, consisting of a jettied entrance extending 1400 feet into the Gulf of Mexico and a channel 140 feet wide and 9 feet deep. The channel would extend from the Gulf of Mexico to the Gulf Intracoastal Waterway in Corpus Christi Bay in the area of the previous channel.

Project Status

The Galveston District has reviewed the local sponsor's preferred plan for the reopening of Packery Channel. A Project Report was prepared and sent to Corps headquarters (HQ USACE) in December 2000. The report indicated that the local sponsor's plan was technically sound, but did not meet Corps of Engineers standards and criteria. The report also stated that environmental acceptability could only be determined after completion of the environmental studies and preparation of an Environmental Impact Statement (EIS).

The District has been given approval to proceed with a redesign of the local sponsor's plan for the reopening of Packery Channel to meet Corps of Engineers standards and criteria. The District is also continuing with the environmental studies and the preparation of an EIS. Estimated time to complete these processes is approximately 16 months.

Although the initial wave modeling study performed in 1996 conformed to Corps of Engineers criteria, the criteria was changed in 1998. A new wave model study will be conducted in accordance with the new criteria using 25 years of historical data. Purpose of the model is to determine sediment transport along the coastline which will result in the design length and orientation of the rock jetties, requirements for renourishment of the beach on the south side of the jetties and the frequency of the cycles for maintenance dredging. Upon completion of the redesign, a new cost estimate will be developed for construction and cost of maintenance.

dredging.

Public Involvement

The initial Corps' sponsored public scoping meeting was held on September 7, 2000 at the Bayfront Plaza Convention Center in Corpus Christi, Texas. Several people spoke in the open forum, both for and against the project. All comments were recorded officially by a court reporter. Written comments were also accepted for a 30 day period following the scoping meeting. All concerns are being considered in the formulation of the redesign of the project.

Additional public meetings will be scheduled during the preparation of the EIS. All meetings will be advertised in advance in the local newspapers. Anticipate that the next public meeting will be scheduled in the October-November time frame.

Project History

A Reconnaissance Report was completed in December 1998 identifying a Federal interest in pursuing feasibility studies for environmental restoration. Nueces County, the local sponsor at that time, had already contracted for several major engineering and environmental studies, in anticipation of possibly constructing the reopening of Packery Channel as a permit action. The plan that had been developed by Naismith Engineering, Inc. for Nueces County, became known as the local sponsor's preferred plan. In March 2000, the City of Corpus Christi became the local sponsor for the project in an agreement with Nueces County.

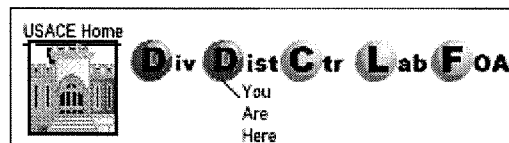
The Water Resources Development Act of 1999 (WRDA 99) directed the Secretary to carry out a project for ecosystem restoration and storm damage reduction at North Padre Island, if the Secretary determined that the work is technically sound and environmentally acceptable. Pursuant to this legislation, the District received guidance from HQ USACE to develop a Project Report to determine if the sponsor's locally preferred plan was technically sound and environmentally acceptable. The report was completed and forwarded to HQ USACE in December 2000 stating that the project was technically sound, but did not meet Corps of Engineers standards and criteria and that environmental acceptability could only be determined after completion of the EIS process. Based upon this report, the District was given approval to proceed with efforts to bring the sponsor's plan into compliance with Corps of Engineers standards and to continue with the environmental studies.

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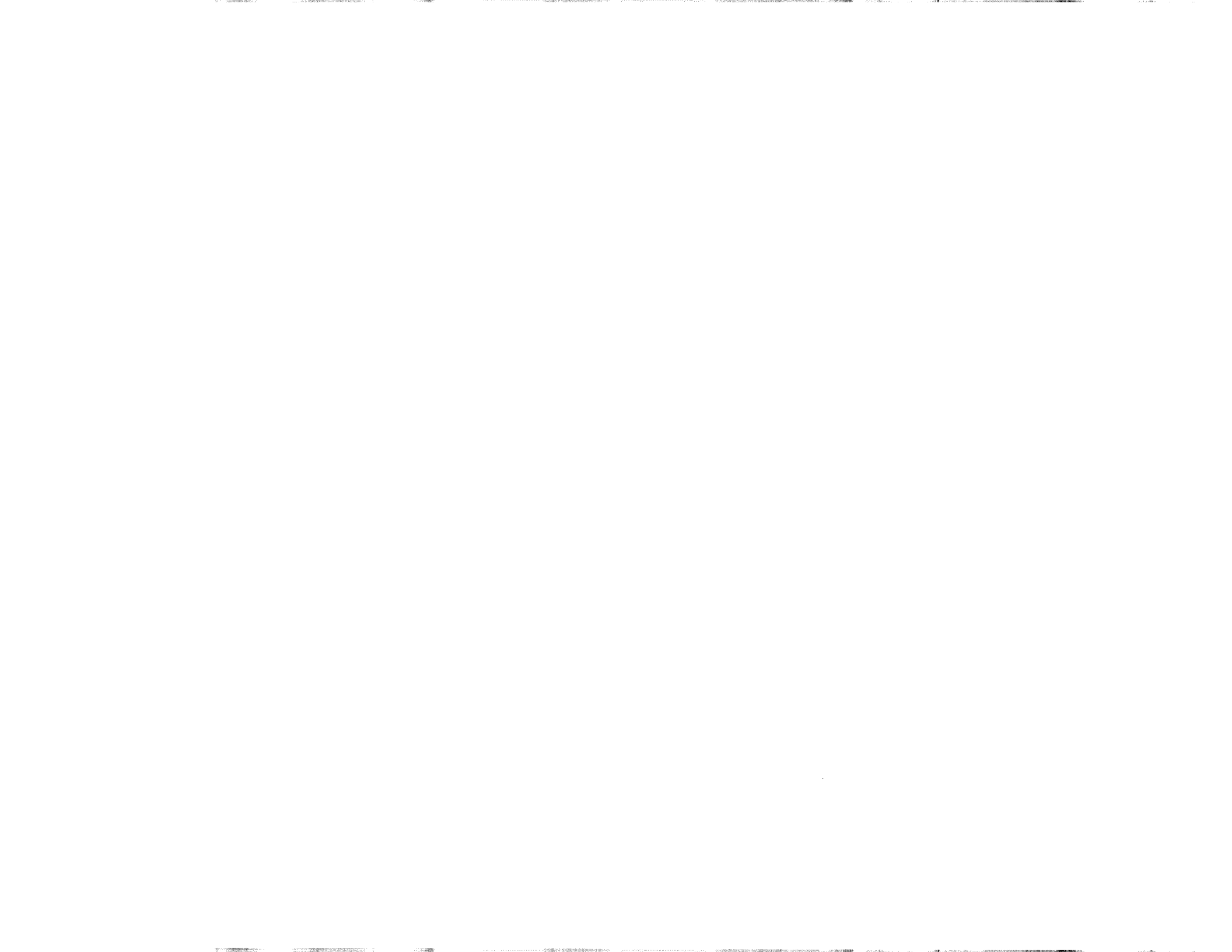
Public Affairs Office
CESWG-PA
SWG-PA@usace.army.mil
P.O. Box 1229
Galveston, TX 77553-1229

Standard Disclaimers

Please read this privacy and security notice.



Updated: October 12, 2001



APPENDIX G-2

AGENCY CORRESPONDENCE



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

ADDRESS ONLY THE DIRECTOR
FISH AND WILDLIFE SERVICE

In Reply Refer To:
FWS/DHC/BFA
CCU 97-02009

26 NOV 1997

Honorable Phil Gramm
United States Senate
Washington, D.C. 20510

Dear Senator Gramm:

Thank you for your letter of September 5, 1997, also signed by Senator Kay Bailey Hutchison and Congressman Solomon P. Ortiz, requesting that the Fish and Wildlife Service provide information about the proposal to reopen Packery Channel near Corpus Christi, Texas. An identical letter is being sent to each signatory. Your letter asked for specific responses to two issues as they relate to the Federal significance of the project.

Ecological Issues

In the mid-1980s, while searching for alternatives to offset the impacts of construction of the U.S. Navy's Homeport project at Point Ingleside, Texas, the Fish and Wildlife Service assessed the potential salinity-related effects of reopening Packery Channel. Using models designed to predict salinity effects on the brown shrimp and the spotted sea trout, we estimated that the reopening's impact on these species would adequately mitigate the Navy project's impacts. The Fish and Wildlife Service, National Marine Fisheries Service, and Texas Parks and Wildlife Department all recommended the alternative of reopening the channel to the Navy, and we drafted a portion of the Homeport Environmental Impact Statement explaining its modeling results.

Shrimp, trout, threatened piping plovers, and other species would benefit from the reopening. The moderation in the Upper Laguna Madre's salinity caused by mixing its waters with the less saline waters of the Gulf of Mexico would be accompanied by a moderation of the cooler lagoon's temperature. We expect that these changes will encourage the growth of smooth cordgrass and black mangroves, and promote habitat diversity without displacing habitats important to species like the piping plover. Oysters historically thrived in the washover pass areas at the southern end of Mustang Island when Packery Pass and nearby passes were open, but became scarce in the high Laguna Madre salinities that prevailed when the passes closed. Permanently reopening the channel is expected to once more ensure that live oyster reefs are a feature of Kate's and Deadman's Holes, two popular fishing sites in Laguna Madre near Packery Channel.

When the Army Corps of Engineers permit was issued in 1988, the reopening did not affect any federally threatened and endangered species. However, when the permit was renewed in 1994, the piping plover, a species known to occur in the project area, had been added to the Federal threatened list. The Fish and Wildlife Service and the Corps formally consulted over the possible effects of the reopening and found the proposed action was unlikely to jeopardize the continued existence of the piping plover. The Fish and Wildlife Service's biological opinion noted that a few foraging piping plovers in the Packery Pass vicinity would be displaced by the reopening and associated increased human activities nearby. However, the Fish and Wildlife Service found that because the reopening would increase the tidal amplitude near the pass, the plover and other shorebirds would likely benefit from a net increase in feeding habitat.

Recreational Opportunities

The project, as planned, will be beneficial although a number of tradeoffs exist regarding recreation and other issues. Fishing at Packery Pass is normally confined to people who can wade in the surf or the lagoon west of Mustang Island, or operate boats in those areas. Fishing in this area conflicts with other recreational activities because of the surfing pier and an associated recreation area on the surf side of the pass. Those attempting to fish northwest of the pass have long hikes, and have sometimes driven vehicles through piping plover concentration areas in an attempt to shorten the distance. Handicapped fishers are virtually eliminated from surf and lagoon fishing sites by the soft sands and muds at these locations. If Packery Channel were reopened as proposed, the walk would be only a few feet from a vehicle to fishing waters. Judging from similar conditions created temporarily at the Mustang Island Fish Pass, the reopened Packery Channel should provide increased fishing opportunities.

The project would provide improved safety for small watercraft operations. Currently, boaters have an hours-long task of crossing the Upper Laguna Madre and Corpus Christi Bay twice each time they put to sea. With Packery Channel open and maintained to a depth of eight feet, the project provides safety to small craft by allowing boats from Lake Padre, Padre Isles, and Laguna Shores channel subdivisions to be at sea in minutes and be back in calm waters sooner when the weather deteriorates. The project would also provide benefits to bird watchers. For example, bird watching platforms, wooden walkways, interpretive displays, and a gated parking area for school field trips are planned for the high ground at the site.

The sand removed during the project's initial and maintenance dredging can be used to restore beach and vehicular access to a heavily eroded stretch in front of the North Padre Island seawall a few thousand feet south of Packery Channel. Other proposed uses of the dredged sand include construction of dunes to enhance North Padre Island's hurricane protection and aesthetic features. The surfing pier and the J.P. Luby Park lie in the project's path. It has been proposed that both be moved to a location south of the seawall. A large parking lot has also been proposed at this site to reduce vehicle traffic on the beach in front of the seawall.

Honorable Phil Gramm

3

Other Issues

There are three areas of uncertainty that should be considered concerning the project. They are 1) sediment balance, 2) salinity, and 3) secondary development. There is concern that the engineering analyses, which resulted in a favorable model of potential currents and sediment balance, underestimated the maintenance volumes and long-term costs of the project. The engineering analyses also indicated that the expected salinity changes may not extend as far into the Laguna Madre as first thought. In consultation with the Corps, the Fish and Wildlife Service also considered the issue of the reopening's potential to encourage secondary development on the barrier island. The consultation concluded that while the reopening would likely accelerate the pressure for secondary development, the wetland, flood insurance, and dune protection laws would make development unlikely. These uncertainties do not significantly affect our position that the ecological effects of reopening the Packery Channel are likely to be beneficial overall.

If you have any further questions regarding this project, please feel free to contact Ms. Nancy Kaufman, our Southwest Regional Director, at 505/248-6282.

Sincerely,

JAMIE RAPPAPORT CLARK

DIRECTOR

IDENTICAL LETTERS TO:

Senator Kay Bailey Hutchison
Congressman Solomon P. Ortiz



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

September 29, 2000

Colonel Nicholas J. Buechler
District Engineer, Galveston District
Department of the Army, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Colonel Buechler:

The National Marine Fisheries Service (NMFS) has reviewed the notice of studies for the Packery Channel-North Padre Island Storm Damage reduction and Environmental Restoration Project Corpus Christi, Texas, advertised on August 17, 2000. The project purpose as stated in the public notice is to "provide storm damage reduction and environmental restoration by creating an opening between the Gulf of Mexico and Corpus Christi Bay, and placing excavated material in front of Padre Island Seawall." The proposed project is located on Packery Channel, a historically intermittent intertidal Gulf inlet on Mustang Island, Nueces County, Texas.



Representatives from NMFS and other Federal and State resource agencies participated in a meeting on February 22, 1999, to provide input on a proposed scope of work for studies to be utilized for the Corps Expanded Project Study Plan for this project. Major issues identified by NMFS included: 1) direct wetlands and seagrass habitat impacts; 2) indirect wetlands and seagrass impacts from erosion, channel scouring, tidal amplitude changes, or salinity alterations; 3) management of dredged material; and 4) cumulative impacts to wetlands and seagrasses on and around Mustang and North Padre Islands from future development (e.g., marinas, canal subdivisions and recreational boat access channels) that will occur as a result of the dredging of Packery Channel.

In addition to our previous comments, the National Environmental Policy Act statement being prepared by for the project should identify Essential Fish Habitat (EFH) located in the project vicinity, potential adverse impacts to EFH, and proposed mitigation options to offset adverse impacts to EFH. Detailed information on Federally managed fisheries and their EFH is provided in the 1998 amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council. The 1998 generic amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 94-265).



If we may be of further assistance, please contact Mr. Rusty Swafford of our Galveston Facility at (409) 766-3699.

Sincerely,


 Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division



United States Department of the Interior

NATIONAL PARK SERVICE

INTERMOUNTAIN REGION
Intermountain Support Office - Denver
12795 West Alameda Parkway
Post Office Box 25287
Denver, Colorado 80225-0287

IN REPLY REFER TO: ER-01/0405

June 14, 2001

Carl Anderson
Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

RE: Packery Channel-North Padre Island Storm Damage Reduction and
Environmental Restoration Project, Corpus Christi, Texas

Thank-you for the opportunity to comment on the subject Notice of Intent. This project is in the vicinity of Padre Island National Park, therefore, comments are focused on how this project may affect this park unit.

It seems that opening up the Packery Channel for the purpose of storm damage reduction and environmental restoration would indirectly result in housing developments along the channel, on the north side of Padre Island Drive (Park Road 22). Planned development is similar to that existing on the south side of the road, down to the northern boundary of Texas General Land Office administered lands. This project would result in impacts to wetlands and Laguna Madre seagrass beds, neo-tropical migratory loafing/feeding areas, etc., and the project is opposed by most environmental organizations. The project area is over 12 miles north of the Park boundary so there are few (if any) direct impacts to Padre Island. Other indirect impacts will no doubt be from increased visitor use and associated impacts from recreational boating on the Laguna Madre within the park.

The NPS has the following questions/comments:

1. Is the Corps of Engineers, in developing the channel to facilitate boating traffic, subject to Section 4(f) of US Department of Transportation? Is the State of Texas Department of Transportation subject to this regulation and associated policies if it receives federal funds for the project? In referring to U.S. Department of Transportation policy paper memorandum, dated Oct. 5, 1987, regarding protection and "preservation of the natural beauty of...public park and recreation lands, wildlife and waterfowl refuges, historic sites, and lands of local significance," it would seem counter to the policies set forth in this memo that federal funds would be used to construct this project.

2. Padre Island National Park would like to be involved as an "interested party" on this EIS project. It is important that the park address the indirect and cumulative impacts from this action.

The National Park Service appreciates the opportunity to comment. Please keep this office informed of the development of this project. If you have any questions, please feel free to contact me at (303) 969-2036.

Sincerely,

/s/ Laurie Domler
NEPA/Section 106 Specialist



REPLY TO
ATTENTION OF.

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

June 6, 2002

Environmental Section

TO INTERESTED PARTIES:

A copy of the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53) is available for your review and comment. This document has been prepared in accordance with Section 102 (2) (c) of the National Environmental Policy Act (NEPA).

Please send any comments or requests for paper or electronic (CD) copies of this document to the above address. Your comments will be thoroughly considered in revising the DEIS and included in the final document as submitted.

This document has been filed with the U.S. Environmental Protection Agency (EPA) pursuant to the President's Council on Environmental Quality guidelines implementing NEPA (40 CFR Parts 1500 – 1508). This document is being concurrently sent to Federal, State, and local agencies, civic and environmental groups, and others known to be interested in this study. The EPA filing date and the closing date for the 45-day review period will be noted in the Federal Register of June 14, 2002. For your comments to be considered in preparing the final document, they must be postmarked no later than the closing date of the 45-day review period.

Questions regarding this report may be addressed to Mr. Sam J. Watson at (409) 766-3946.

Sincerely,

Lloyd Saunders
Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental
and Regulatory Division

Enclosure



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

June 14, 2002

Environmental Section

Mr. Mark Fisher
Texas Natural Resources
Conservation Commission
P.O. Box 13087
Austin, Texas 78711-3087

Dear Mr. Fisher:

Please find enclosed two copies of the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). One copy is provided for your agency's review and comment during the 45-day review period in accordance with the National Environmental Policy Act (NEPA) and the other is provided for your review to determine water quality certification.

This document is being concurrently sent to Federal, State, and local agencies, civic and environmental groups, and others known to be interested in this study. The EPA filing date and the closing date for the 45-day review period will be noted in the Federal Register of June 14, 2002.

Your comments on the DEIS and determination of water quality certification are requested by July 29, 2002, so the Final EIS can be prepared. I appreciate your timely review of these draft documents. If you have any questions, please contact Mr. Sam J. Watson at 409/766-3946.

Sincerely,

Lloyd H. Saunders
Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental
and Regulatory Division

Enclosures



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

June 14, 2002

Environmental Section

Ms. Georgia Cranmore
Assistant Regional Administrator for Protected Resources
National Marine Fisheries Service
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

Dear Ms. Cranmore:

Please find enclosed a copy of the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). This is provided for your agency's review of the Biological Assessment (BA) in accordance with the Endangered Species Act. The BA is included in the DEIS in Appendix C. We are sending another copy to Mr. Rusty Swafford in the Habitat Conservation Division at the Galveston office of the National Marine Fisheries Service for review and comment of the DEIS during the 45-day review period in accordance with the National Environmental Policy Act (NEPA).

I would appreciate it, if you would review the Draft BA and provide a letter of concurrence or a Biological Opinion (BO), as you deem necessary. These documents are being concurrently sent to Federal, State, and local agencies, civic and environmental groups, and others known to be interested in this study. The NEPA filing date and the closing date for the 45-day review period will be noted in the Federal Register of June 14, 2002.

Your letter of concurrence or a BO are requested by July 29, 2002, so the Final EIS and BA can be prepared. I appreciate your timely review of these draft documents. If you have any questions, please contact Mr. Sam J. Watson at 409/766-3946.

Sincerely,

Lloyd H. Saunders
Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental
and Regulatory Division

Enclosures



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

June 14, 2002

Environmental Section

Mr. Allan Strand
Field Supervisor
U.S. Fish and Wildlife Service
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412


Dear Mr. Strand:

Please find enclosed two copies of the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). One copy is provided for your agency's review and comment during the 45-day review period in accordance with the National Environmental Policy Act (NEPA), and the other is provided for your review of the Biological Assessment (BA) attached to the DEIS in Appendix C in accordance with the Endangered Species Act.

I would appreciate it if you would review these documents and provide comments on the DEIS and a letter of concurrence or a Biological Opinion (BO), as you deem necessary. These documents are being concurrently sent to Federal, State, and local agencies, civic and environmental groups, and others known to be interested in this study. The EPA filing date and the closing date for the 45-day review period will be noted in the Federal Register of June 14, 2002.

Your comments on the DEIS and letter of concurrence or BO are requested by July 29, 2002, so the Final EIS and BA can be prepared. I appreciate your timely review of these draft documents. If you have any questions, please contact Mr. Sam J. Watson.

Sincerely,


Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental
and Regulatory Division

Enclosures



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

June 14, 2002

REPLY TO
ATTENTION OF:

Environmental Section

Mr. Rusty Swafford
Habitat Conservation Division
National Marine Fisheries Service
4700 Avenue U
Galveston, Texas 77550


Dear Mr. Swafford:

Please find the enclosed copy of the Draft Environmental Impact Statement (DEIS) for the North Padre Island Storm Damage Reduction and Environmental Restoration Project (PL 106-53). This is provided for your agency's review and comment during the 45-day review period in accordance with the National Environmental Policy Act (NEPA). We are also sending a copy to Ms. Georgia Cranmore, Assistant Regional Administrator for Protected Resources, in the Regional Office of the National Marine Fisheries Service for review of the Biological Assessment (BA) in accordance with the Endangered Species Act. The BA is included in the DEIS in Appendix C.

These documents are being concurrently sent to Federal, State, and local agencies, civic and environmental groups, and others known to be interested in this study. The EPA filing date and the closing date for the 45-day review period will be noted in the Federal Register of June 14, 2002.

Your comments on the DEIS are requested by July 29, 2002, so the Final EIS can be prepared. I appreciate your timely review of these draft documents. If you have any questions, please contact Mr. Sam J. Watson at 409/766-3946.

Sincerely,


Lloyd H. Saunders, Ph.D.
Chief, Planning, Environmental
and Regulatory Division

Enclosures